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ADDRESS.

SOME RECENT ADVANCES IN PEDIATRICS.

CHAIRMAN'S ADDRESS.

Read in the Section on Diseases of Children at the Forty-fourth Annual Meeting of the American Medical Association.

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In greeting you at the annual re-assemblage of the Section on Diseases of Children, it is my first duty to express to you my sincere thanks for the high honor that the Section has conferred upon me. The special study of the diseases of children is in the developmental period. I think it a great honor to hold so prominent a position in the vanguard.

I entered upon the duties of this office with a full realization of the responsibility which must rest upon one who attempts to guide the early and often tottering footsteps of the childhood period of a great organization, and I sincerely hope that my efforts have been, and will be, for the highest good of the Section.

The recent changes made in the organization of the AMERICAN MEDICAL ASSOCIATION, giving to the sections and to the scientific work their proper position as the leading factors in the organization, impose upon the members of the Section the responsibility of conducting its affairs in a manner becoming the dignity in the ASSOCIATION to which it has been elevated, and befitting the importance to the profession of its deliberations and discussions.

The distinguished men who have conducted the affairs of the Section in the past, have encountered the difficulties that attend the development of an imperfectly differentiated section. While the attendance upon the meetings has often been large, and the character of the work done of a high order, the Section has lacked cohesion and coöperation. With a diffuse and unstable membership, it has not exerted in the ASSOCIATION the influence it should, nor have its utterances been promptly and fully set before the profession.

A glance at the program of this meeting shows that the subjects for discussion cover a wide range in general medicine and surgery. While the other specialties deal only with the diseases of certain organs and correlated groups of organs, pediatrics, with a few exceptions, covers the whole field of the medical and surgical specialties. It legitimately includes all manifestations of disease in early life, and the physician who aspires successfully to cope with the diseases of children must be well qualified in all departments of medicine and surgery. I predict that the specialist in diseases of children is destined to become the highest type of the general practitioner. He is the old family doctor, rehabilitated and thoroughly equipped with all the resources of modern medicine.

Including in its membership, as it does, physicians from all parts of this country, from cities and rural districts, men who, with but few exceptions, are general practitioners of medicine, this Section is most favorably organized to carry out, as the national representative of pediatrics, its proper function of collecting and disseminating the most advanced teaching in this department of medicine.

The metropolitan specialist will here meet, and will be benefited by the observations of the rural practitioner, and he can give in return the exact knowledge that his unique experience has brought him.

To make more efficient the work and to firmly establish the Section's autonomy, your Chairman believes that it is necessary,

1. To cultivate a more intimate social relation among members. The custom adopted by some of the sections to hold an annual social reunion is to be commended, and I sincerely hope that at this meeting the necessary steps will be taken to make such a reunion a fixture in the proceedings of the Section. I believe that only in this way can members develop the familiarity with one another that is essential to free discussion and consequently thorough scientific work.

2. To promptly publish full reports of the proceedings of the Section. Contributors to section work are apt to be disheartened by publication of important papers months after the reading, and disconnected from important discussions and criticisms. The editor of the JOURNAL has assured me that the proceedings of the Section will be published as prepared, and in the order presented by the Section officers. Under the by-laws this work of editing the proceedings falls upon the Executive Committee. All the publications of the Section should be carefully revised by this Committee, and it should use its influence in the Business Committee of the general association to have assigned to it a competent reporter to assist the Secretary. Well-prepared abstracts of papers and discussions will be sought for publication by the great journals of the country, and their wide circulation will bring credit to the Section.

In addition to the more extended reports of original clinical observations and laboratory experiments, your Chairman believes it would add greatly to the value and interest of the proceedings for the officers of the Section to arrange for short, practical papers and full discussions on subjects that, while not necessarily new, are of absorbing interest to all practitioners of diseases of children.

In the present meeting, the officers have arranged for a series of short papers upon practical subjects, to be treated by a number of writers, and approaching the subjects from many sides. Should they prove a success, this method may be further ampli-

fied and will certainly add greatly to the value of the meetings.

The by-laws of the ASSOCIATION make it the duty of the Chairman in his address to review the work done in pediatrics in the preceding year. It would be unprofitable and unnecessary to attempt to cover the whole field of pediatric literature, although it may be of value to the Section to briefly note some of the most recent advances, not so much to tell the members what is new, as to point out the direction that thought and investigation are tending in this department of medicine.

The literature of the last year shows a decided increase in the use of the bath, in the acute diseases of infancy and childhood. The general introduction of the treatment of typhoid fever by the systematic use of cold baths, has brought prominently before the profession the great value of the bath: 1, to reduce temperature; 2, to promote nutrition; 3, to stimulate respiration and circulation; 4, to allay dangerous nervous symptoms.

The popular prejudice against the use of this agent is rapidly disappearing, and I predict that at no distant date the physician will as often receive the suggestion of the use of the bath, as he now is offered the diagnosis of dentition, or the therapeutic advice of a vermifuge. This change must be looked upon with eminent satisfaction. In many of the mild febrile diseases of childhood, it gives comfort and quiet, while in the continued fevers, the exanthemata, grave pulmonary, intestinal and nervous diseases, and all conditions attended by hyperpyrexia, it is a remedy on which the hard pressed physician may call with a confidence begotten of many faithful services.

In many pyrexial conditions the coal-tar antipyretics serve well. It will be noted that the tendency, very properly I think, is to confine their use to painful and distressing pyrexial conditions that are short and sharp in their course, and not ordinarily dangerous to life. In diseases having a dangerous and lengthy course, they are used, if at all, only to dull the shock of the onset of the disease.

Authorities on diseases of children recognize typhoid fever as a disease of infancy occurring, however, rather rarely and pursuing an atypical course. In a paper by Dr. W. P. Northrup, read before the American Pediatric Society, 2,000 autopsies are recorded covering a service in the New York Infant Asylum of ten years. Dr. Northrup, in that remarkable experience never met the characteristic anatomic change of typhoid. O'Dwyer with a service of twenty years, in the same institution has had the same experience. In the discussion that followed Dr. Northrup's paper, other New York physicians related the same experience. Drs. Earle and Christopher of Chicago, Blackadder of Montreal, Rotch of Boston, and Adams of Washington had seen cases of typhoid in infants under two years of age.

In about two hundred of the autopsies made by Dr. Northrup, swollen spleens, Peyer's and mesenteric glands were found. These children died of pneumonia, convulsions and various intestinal diseases; in fact, no relation between the clinical phenomena and the pathologic findings could be made out. Dr. Northrup concludes that such anatomic changes are not indicative of typhoid in infancy, and his experience casts a doubt on the existence of typhoid in infants under the age of one year. It certainly shows the disease to be one of remarkable rarity. Observations in the future by the members of this Section may aid to settle this important question.

The great activity manifested in the investigations of infant feeding, shows that many of the perplexing and important problems connected with this subject are still unsettled. The modification of cow's milk, to more nearly approximate the chemic composition and digestibility of human milk, seems to be the most important question writers have discussed. The composition of the various proprietary infants' foods is now well known to the profession, and their adaptability to certain cases is well understood. So long as their composition is kept uniform, they are useful aids to the physician.

Sterilization of milk is on trial at the present time. Sterilized milk received the enthusiastic approval of the profession and laity. Extensive clinical experience has shown that, as prepared in the domestic laboratory, it is far from being a perfect infant food. Sterilized at the usual temperature of 212 degrees, milk undergoes changes that probably lessen its digestibility, and certainly, unpleasantly modify its taste. Prof. Leeds has shown that at a temperature of 167 degrees F., no coagulation of milk proteids takes place, and Dr. Rotch in a valuable article on the "Value of Milk Laboratories," has demonstrated that at this temperature milk retains its uncooked taste, and will remain free from developed bacteria for thirty to thirty-six hours. In ordinary infant feeding such sterilization of milk, or more properly Pasteurization, is all that is necessary.

In this article, Dr. Rotch has detailed the appurtenances and methods of a perfect milk laboratory that is in operation in Boston, where is dispensed on physicians' prescriptions, milk containing any percentage of fats, proteids, carbo-hydrates and water that the prescription calls for. The milk, from the time it leaves the cow until it reaches the consumer, is handled with all the care that modern bacteriology suggests. Every physician who has to prescribe milk for infants has felt the demand of such a laboratory, and the earnest thanks of the profession is due Dr. Rotch for successfully putting into experimental operation such a work.

The recent combined clinical and bacteriologic investigations into the etiology of diphtheria, have been attended by the brilliant result of definitely separating this disease from its various clinical imitators.

Expert clinicians have long recognized the fact that the pseudo-membranous diseases of the throat and respiratory tract vary greatly in their nature and malignancy, and many attempts were made to classify them and formulate clinical rules for their differential diagnosis. Disasters so often showed the imperfection of clinical rules of diagnosis, that conscientious physicians were often driven to the necessity of considering all pseudo-membranous throats to be diphtheria and to act accordingly.

As the result of brilliant labors in the same line that have given to science the exact pathology of anthrax, tuberculosis, erysipelas and other specific diseases, bacteriology has come forward, has solved the problem of etiology and offers a positive method of differential diagnosis. After a somewhat prolonged period of scientific doubt, the Klebs-Löffler bacillus is now almost unanimously recognized to be the sole originating cause of true diphtheria. The

pseudo-membranous anginas are now classified according to the presence or the absence of the Löffler bacillus into true diphtheria, or, simply, diphtheria, and pseudo-diphtheria.

The investigations of Löffler, Roux and Yersin, Martin, Brieger and Fränkel, Klein, Welch and Abbott, Prudden, Park and others have demonstrated that, arrested upon a denuded or susceptible mucous membrane favorable to its development and propagation, the Löffler bacillus grows and produces a a local inflammation usually attended by the formation of pseudo-membrane. The bacillus is not, except in very rare instances, absorbed into the lymph or blood circulation; it does not invade internal organs, nor does it penetrate in its growth the underlying tissues. It remains localized upon the surface of the infected mucous membrane. The bacillus is not in itself toxic. In its growth, however, it elaborates a body, considered from its properties to be of the nature of a ferment. This ferment is absorbed from the seat of the diphtheritic inflammation by the circulation, and in contact with certain proteids digests or decomposes them with the formation of albumoses and an organic acid. These products of proteid decomposition, the albumoses and the organic acid, are the toxic agents, and it is they that cause the characteristic symptoms of diphtheria unfortunately so familiar to us all. The terrible toxicity of these bodies is shown by the experiments of Brieger and Fränkel, who found that .0004 gram was enough to kill two rabbits each weighing three kilograms.

Pseudo-Diphtheria.—The familiar investigations of Prudden in 1888 upon twenty-four cases of pseudo-membranous angina, and his failure to demonstrate the Löffler bacillus threw a doubt in this country upon the etiologic relation of that organism to diphtheria. His own, and other subsequent observations, have shown that the cases he studied were cases of pseudo-diphtheria, and the study of various observers has cleared up, in the last year, much of the confusion that has existed in the profession concerning these clever imitations of diphtheria.

Without going into detail, it may briefly stated that the pseudo-diphtherias are pseudo-membranous anginas that are caused by the growth and development upon the diseased membranes of various forms of cocci, chiefly the streptococcus. Unlike the Löffler bacillus, the streptococcus may extend its growth into the tissues underlying the infected mucous membranes, may be absorbed into the lymph and blood channels, and may infect deeply seated organs.

To show the diagnostic and prognostic relations of the two forms of pseudo-membranous inflammations, I will briefly give the results of the bacteriologic study of a large number of cases by several observers. In 154 cases, clinically diagnosticated diphtheria, Baginsky found the Löffler bacillus in 118 and streptococci and staphylococci in 36. The mortality in the Löffler, or true diphtheria cases was 38⅛ per cent. In the uncomplicated coccus-diphtheria no per cent. Martin, in 200 cases of supposed diphtheria found the Löffler bacillus in 128 and cocci in 72; twenty-nine of the cases of coccus-diphtheria were croupous. Without giving figures he stated that the mortality in the true diphtheria was much greater than in pseudo-diphtheria. Koplik, in thirty cases found seventeen in which no Löffler bacilli were present. Park records, in two series, 244 cases in which the clinical diagnosis of probable diphtheria was made. In 127 cases, Löffler bacilli were found, and in 117, streptococci and other cocci. The mortality in the true diphtherias was in the first series of 140 cases, 46.5 per cent.; in the pseudo-diphtherias, 5⅜ per cent. In the second series of 104 cases, the true diphtheria showed a mortality of 26 per cent.; the pseudo-diphtherias, one death in 31 cases.

The detailed reports of these observers show that many cases of pseudo-diphtheria and true diphtheria could not be differentiated clinically one from the other. Not until a bacteriologic examination was made, was a correct diagnosis possible. The laboratory observations, therefore, scientifically demonstrated what many of our ablest clinicians have long held: viz., that the varying clinical histories show that there are at least two types of pseudo-membranous inflammation; one intensely malignant, the other, or others, very benign, and that the clinical phenomena presented by these are often so similar that the most expert diagnostician is baffled in his attempt to differentiate them. This is the position I have held in the discussion of croup and diphtheria for the last ten years.

The study of the pseudo-diphtherias is of great interest, and I will quote from Dr. Parks his classification of them, and his observations on differential diagnosis:

"*1. Pseudo-Membranous Angina.*—In the typical cases a thin, friable, grayish pseudo-membrane covers the margins of the uvula, faucial pillars, and sides of pharynx, the tonsils frequently having thicker exudates. In the less marked cases only the uvula or faucial pillars, with or without the tonsils, are affected. In these the local and constitutional symptoms differ greatly; when uncomplicated with other infectious diseases they seem to regularly recover, unless the larynx is involved.

"*2. Pseudo-Membranous Laryngitis.*—In these cases the larynx and bronchi are chiefly affected. They may die from suffocation, or from the complicating bronchitis and broncho-pneumonia.

"*3. Croupous Tonsillitis.*—In these the tonsils are more or less completely covered by patches of exudate or pseudo-membrane. The local and constitutional symptoms are frequently marked in the first few days. They regularly recover.

"*4. Follicular Tonsillitis.*

"*5. Acute Pharyngitis and Tonsillitis without exudate.*

"*6. Cases similar to all the foregoing, but complicating infectious diseases.*—These have a considerable mortality.

"For prognosis, the points to be mainly considered were the age, the location of the membrane, the condition of the bronchi and lungs, the temperature and the relation to other infectious diseases.

DIFFERENTIAL DIAGNOSIS.

"From the point of view of diagnosis, it is important to fully understand that there are many of the less characteristic cases of diphtheria, which are so similar in symptoms and appearances to cases of pseudo-diphtheria that they can not be separated from them except by bacterial cultures. Among the cases examined I have found that:

"No case of follicular tonsillitis in an adult was true diphtheria. No case presenting a typical ap-

pearance of well-marked cases, such as those described as pseudo-membranous angina under pseudo-diphtheria, was true diphtheria.

"Most cases of pseudo-membranes and exudates, confined to the tonsils in adults were not diphtheria, but a few cases looking just like them were. Most cases of acute inflammation of the pharynx and fauces, with very little or no exudate or pseudo-membrane, were not diphtheria, but a very few were, and in all of these there was a direct history of infection. The majority of uncomplicated cases of pseudo-membranous laryngitis were true diphtheria, but a few in the summer and fall, and quite a number in the late winter and spring were not true diphtheria. In most, a clinical differential diagnosis was impossible without cultures. In young children, cases of diphtheria with exudate confined to or extending beyond the crypts, and those with little or considerable pseudo-membrane were at times true diphtheria and at times not. The two classes of cases often presented similar appearances. True pseudo-membranes confined to the nose were, in all uncomplicated cases, true diphtheria.

"In the milder cases of pseudo-membranous inflammations, one condition was frequently observed, which was an almost certain sign of true diphtheria. This was the presence of irregularly placed patches of adherent pseudo-membrane on some other portions than the tonsils or margins of the faucial pillars or uvula. The amount of membrane usually differed on the two sides. The thick gray pseudo-membranes which cover a large portion of the tonsils, the soft palate, and often nostrils, and naso-pharynx were always the lesion of true diphtheria."

Upon the line of these observations we must now deal with pseudo-membranous inflammations. They are pregnant with wisdom that is of inestimable value in diagnosis, prognosis, preventive and curative treatment.

Dr. Park details the technique of his culture methods for diagnosis, and the writer is making a test of these from the standpoint of the private practitioner. The results are not as yet perfectly satisfactory. The position of the question and the value of bacteriologic diagnosis at present is best summed up by Koplik in his article. He says:

"Clinically it is impossible, from simple inspection, to sift the cases of non-characteristic true diphtheria from other forms of non-diphtheritic angina."

In the bacteriologic examination of these cases, and with the subsequent animal tests, lies the only true diagnosis. Is it possible for us at present, in private practice, to examine each case as has been done in the foregoing studies? The author is not so sanguine upon this last point as Baginsky of Berlin, in his last article upon diphtheria. It is possible in the clinic and hospital to do such work, for the facilities are readily at hand, as also the conditions for study. In private practice, however, for the present we must insist upon the proper isolation of all doubtful cases of throat disease, and the time is right for pushing the doctrine of isolation to its farthest limits.

Gentlemen, I now announce the Section on Diseases of Children to be open and ready to proceed with the business before it.

ORIGINAL ARTICLES.

RETURN OF VOICE AFTER LARYNGECTOMY.

ALTHOUGH THE LUNGS AND TRACHEA ARE ENTIRELY CUT OFF FROM COMMUNICATION WITH THE THROAT AND MOUTH.

A Clinical Lecture on the Physiopathology of Voice: Illustrated. Delivered at Jefferson College Hospital, Philadelphia, Oct. 20, 1893.

BY J. SOLIS-COHEN, M.D.

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I have to show you, gentlemen, a unique case, one of the most remarkable surgical triumphs of the century; and I doubt whether another just like it exists anywhere else at the present time. Nineteen months ago, in the presence of the class, I removed from this man the larynx and the first ring of the trachea, on account of malignant growth (adeno-sarcoma) protruding externally. The epiglottis was not removed, as it was not involved in the disease. In order to prevent the fluids of the mouth from afterwards descending into the trachea, and the production of septic pneumonia (shluck-pneumonia) with its fatal consequences, (which occurs in a great many cases of this kind after operation), the second ring of the trachea was stitched to the skin in the neck, the first ring having been removed with the larynx. The tracheal orifice can be seen, here, in the middle line of the patient's neck, just above the top of the sternum, and you can readily discern the upper cartilaginous rings and the membranous posterior wall. Since the time of the operation, there has been absolutely no connection between this man's lungs and his mouth. As you observe, he does not wear any tracheotomy-tube, for the trachea is permanently open, and he breathes without difficulty. He has had no pain, no dyspnea, and no dysphagia since the operation; and for more than a year he has had no aphonia. There has not been any return of the disease; and he is apparently in good health.

I did not bring him before you in order to speak of the operation, however, but rather to discuss the physiology of the voice, using the case as an illustration of an entirely unexpected result. It demonstrates the apparent paradox that, in order to speak, a man does not need a larynx. This man can talk distinctly, although with a husky voice, somewhat like that of a man with a sore throat, but loud enough to be heard at a distance of more than thirty feet.

I ask him, "What's your name?" and he replies, "Daniel Hickey, sir," in a tone loud enough to be heard clear across the room.

Again, "How old are you?" and "Forty-seven, sir," you hear him reply, quite distinctly. His voice is as good as is heard in many a case of chronic laryngitis. Now I will ask him to sing for you. (The patient essays a verse of "Come back to Erin," in a low voice, but evidently carrying the tune) and you notice that he even has the power, to some extent, of controlling the pitch of his voice, so as to turn a tune.

Let us now consider the mechanism by which this man phonates. To comprehend this will require also a brief consideration of the mechanism of voice under ordinary, or physiologic conditions. You have noticed how this patient uses his mouth and throat

in articulating. In order to produce a sound, it is necessary to have vibration of something which moves very rapidly. Ordinarily, the vocal bands do this, under the impulse of the air expelled from the lungs. In this patient it is quite different. By gulping air, he distends the skin of his neck into a sac, thus forming an air-cavity, which acts as a supplemental lung as it were. But something more than this air is needed. There must be some band of tissue, which can be held rigid, so that it can be made to vibrate by the currents of the air, which are forced past it. He first takes a deep inspiration to fix the clavicles and the muscles of his neck. Then he takes a gulp of air into a sac of integument just above the orifice of his trachea, which air he then expels in his efforts at articulation, and the accompanying vibration of the band of tissue referred to supplies the place of the lost vocal bands. With one inspiration he can count audibly up to five. There are occasions when his voice is better than at others; but we may state that he finds it quite sufficient for the ordinary purposes of life.

After extirpation of the larynx, in cases similar to this where the larynx has been removed for malignant disease, it has generally been essential that an artificial appliance, or mechanical larynx, be inserted in order that the patient may talk. This artificial larynx is a chimneyed tracheal canula into the external portions of which is inserted a reed or tongue of metal which vibrates, when the patient speaks; but the pseudo-voice is monotonous and unnatural. Such an instrument would not permit a change of pitch, such as we have just heard in the present patient. The voice is like that of a puppet. It is a squeaking voice, something like that used by a Punch and Judy exhibitor.

Upon looking in this man's throat with a laryngoscope mirror this is what I see: the tissues are in a healthy condition. There is a cicatrix running from the base of the epiglottis, downward in the middle line, but a little obliquely from left to right, which is the obverse portion of the cicatrix you see in his neck. Below the epiglottis, the pharynx forms a cavity, of a funnel shape, leading into the esophagus, the opening of which is recognized by a horizontal line. To the left side of this opening, I observe a band of tissue, reaching upwards and backwards towards the wall of the funnel-shaped cavity, and which is covered by mucous membrane; and this I take to be the band which vibrates. This band, I believe to be a portion of the horizontal fibers of the inferior constrictor muscle of the larynx, which the man has utilized, by training, so as to form a new vocal apparatus. Having all the necessary organs of articulate speech, the nasal chambers, pharynx, tongue, teeth, and lips, he only needed a vibrating reed in order to speak again as before the disease of the larynx destroyed his voice. This is an exemplification of one of the pre-Darwinian theories of evolution; the doctrine of Lamarck that in the process of development of organs, function precedes structure. Here, in response to the demand for a voice, there is a utilization of structures which normally subserve purposes quite different.

I will now review briefly the subject of the physiology of voice: voice is a sound produced by the vibration in the larynx of two approximated membranous bands, the vocal bands, which stretch from the thyroid cartilage in front, to the arytenoid cartilages behind, with a linear space between their edges through which the air passes from the lungs. Our studies in acoustics teach that sound is a vibration conveyed to perceptive ears.

To produce the sound, the vibration and the hearing power are both requisite. There are sounds which are composed of vibrations so rapid that they are inaudible to human ears; in fact, it is believed that many of the vibrations produced by insects are inaudible to human ears because the human membrana tympani is unable to vibrate in consonance with them. The ability of different human beings to appreciate rapid vibrations differ. You may have noticed when walking in the country on a summer's day with some friends, that some insect-sounds were heard by some and were not audible to others; to some there would be sound; to others, no sound. This is proof therefore, that sound requires both a commotion in the air to produce it, and a perceptive faculty in the ear to appreciate it. The next point to bear in mind is that this commotion is in the form of waves, of alternate condensation and rarefaction, which proceed in all directions from the place of origin; in other words, these waves are spherical, not circular, and not on a plane. Now, when anything moves as rapidly as sixteen times in a second, the ordinary human ear will begin to hear a rumbling sound which when the motion is made more rapid, will increase proportionately in pitch. The lowest musical tone, appreciated as such by the human ear, is that given by an organ pipe thirty-two feet long, which vibrates sixteen times in a second and is tuned to the C^2 of sixteen and one-half vibrations per second. Sonorous vibrations may be increased in rapidity until they reach a point, or pitch, which the human membrana tympani can not vibrate in unison with, and consequently can not appreciate, and silence ensues.

Sound has three physical qualities: intensity, pitch, and quality, or character of tone. Intensity is simply loudness of sound. It depends on the size of the vibrations or sound waves set up in the atmosphere. The larger the volume of air set in commotion, the more intense the sound. A piano wire will produce a note in intensity proportionate to the width of its excursion, which in its turn is proportionate to its length. A human larynx of large size and with long vocal bands will afford more volume of intensity of sound than a small one, both being used with equal skill. Pitch is independent of intensity and quality. Pitch indicates the position which a note holds in the musical scale. It is due to the rapidity of the vibrations. The more rapid the vibrations, the higher the pitch; the shorter the vibrating medium, the more rapid the vibrations and the higher the pitch. Thus, if while a violin string is vibrating, you shorten it, by placing a finger upon it, you raise the pitch, and the vibrations are more rapid. Quality of tone-character, or *timbre*, as the French call it, is the characteristic peculiarity, which enables you to distinguish one instrument from another, and by which you distinguish one voice from another. By its aid you can, if your ear is good, recognize and follow any single instrument during an orchestral performance. It depends upon the shape of the vibrations. And right here, let me now call your attention to another point, which may be a little difficult to comprehend, but whose importance will be manifest in a few moments. No sound is a simple sound. When you

set a piano string in motion, and it is vibrating as a whole, if you touch it in the middle it will vibrate in halves while it continues to vibrate as a whole, each half vibrating separately and you will hear the octave of the tone mingle with the main tone. In a similar way you can divide it, so that it will vibrate in thirds or fourths and so on, and each aliquot part lends its own tone to the clang. In point of fact, these shorter waves, or vibrations occur also during the vibration of the string as a whole when it is let alone, producing what are called over-tones and under-tones, all vibrating in harmonious accord. Each tone is an orchestral combination in miniature. This is what produces the quality of the sound which is due to the ultimate or composite shape impressed upon the sound waves by the fundamental tone and its upper tones, its combination tones and so on. Nothing proves this so well as the phonograph, which preserves the combined qualities of the different tones, whether of the human voice or of an instrumental accompaniment, or of both, so that the resultant effect may be reproduced and be recognized by the ear. This is because the record in the phonograph is the combined result of all the factors of the sounds; and when given back to the air it reproduces that combined result in the simplest expression. Quality of sound, therefore, is due to the shape of the vibrations; and the shape of the vibrations is due to the supplemental factors producing the over-tones and the under-tones, as well as the fundamental or ground tone. There are some simple physical experiments by which fundamental tones may be tested and eliminated from the clang. For instance, if you strike the body of a violin, you will find that it will give a sound of a certain pitch. Now, if you will strike the proper string in the violin so that gives a note of the same pitch, you will find that that tone will be reinforced by the vibration of the body of the violin more than any other tone. In a similar way, you may strike a note upon a piano which will produce the same tone and the violin will vibrate in unison with it.

For the production of voice, you not only require a simple mechanism for the production of sound, but you also require a resonator, which will act like the sounding board of a piano or the body of the violin. The shape of the vibrations is a physical thing altogether. It depends upon the things which vibrate and the amplitude of the movement. The combination of all these vibrations in a given tone, determines the quality of the tone. In the human voice, we find a resounder in the vault of the pharynx and the nasal chambers. The palate, also the tongue, the teeth and the lips; even the top of the head, may be noticed to vibrate while singing certain notes, or the head, the chest, the trunk and even the body, as a whole, may be felt vibrating. By utilizing the sensations produced in these various resonators, singers obtain the most beautiful effects. I have seen cases of cut throat in which the vocal bands were exposed and the resonator tones were absent by reason of the injury to the continuity of the resonant apparatus, and have noticed that the voice coming directly from the larynx through the opening in the neck is exactly like that of a puppet, because of the absence of the familiar resonance, which gives the natural quality to the human voice. Change the shape of the resonator in the human instrument or in the manufactured one and you have a change in quality. This is the way disease alters the quality of the voice. We may make a simple experiment to show the effect of a change in the shape of the mouth upon the voice. When you open your mouth to the fullest extent and utter a sound, the only sound you can make will be the vowel "ah," (as in father); by closing the mouth a little, and emitting the same sound from the larynx, it will change to "e," (like the a in hate); and as you still farther progressively close the mouth you will get "i", (like e in meet), "o" and "u." These different vocal sounds are due to nothing else than to changes in the shape of the resonator. Certain tones are reinforced in the one instance and other tones in the other instances.

Some twenty years ago, I exhibited to the class at this College and also to the medical class of the University of Pennsylvania, an instrument known as Faber's Talking Machine. In that instrument, the vocal sounds were made by thin plates of ivory, set in vibration by currents of air from a bellows; it showed especially the effects of changing the shape of the resonator, by valves, which changed the quality of the tones. This peculiarity of vocal resonance will serve to explain the difficulty which adult foreigners experience in overcoming accent, and by which their nativity is revealed. For a period of twenty years or more, their vocal organs will have been accustomed to produce the various sounds in their own language, and after the accessory vocal organs have been developed in accordance with such demands, they can not readily accommodate these structures to produce new combinations of sounds. Children learn foreign languages without accent, because their vocal organs are more flexile, but when their original language is retained as the family intercourse, they always retain some of its accents. Thus in England, some years ago, I heard the Prince of Wales speak a number of times and noted with surprise that he had a decided German accent. This is simply because his parents had made German the language of the family. A remarkable peculiarity of the voice is its adaptability to extremes of pitch and intensity, the production of which in musical instruments the work of men's hands requires a large series of factors of different sizes. Remember that to produce the human voice we have only the two vocal bands, at best only an inch in length, a little longer in the male than in the female. They are less than a fourth of an inch in width; and it is only one free edge of each band which is free to vibrate. The wonder is how such a little structure as this is, can produce such a variety of sounds. From two and one-half to three octaves is the ordinary compass of the voice; the combined range of the male and female voices is about five octaves. Exceptional voices may transcend these limits. Thus Mr. Fisher could sing down to F^1 (forty-three and one-half vibrations) while La Bastardella could sing C^6 (2,100 vibrations). The changes in pitch are even more remarkable. Madame Mara with a compass of three octaves, made 2,100 changes of pitch, or 100 between each two notes of the 21 in her compass. Ordinary good vocalists make 150 changes, or 10 for each tone in a compass of 2 octaves or a little beyond. The change of length in the vocal cords to produce these changes of pitch, will not vary more than $\frac{1}{1800}$ of an inch. In Madame Mara, they were not over the $\frac{1}{17000}$ of an inch.

Now, we will proceed to the consideration of how these changes are produced:

The changes of length of the vocal bands are caused by the contraction of the crico-thyroid muscles, and the posterior crico-arytenoids on the one hand, and by the thyro-arytenoids on the other. The vocal bands are attached to the thyroid cartilage and to the crico-thyroid membrane with which they are continuous, at the anterior, lower portion of the thyroid cartilage. Now when the crico-thyroid muscle contracts, it draws upon the cricoid cartilage and pulls it upward and forward, towards the anterior portion of the thyroid cartilage, as you can test on yourselves by placing a finger lightly on your cricoid cartilage while uttering a sound in a high pitch. This puts the vocal cords upon the stretch lengthwise. This is, however, only a part of the mechanism. If a person sings the scale, while you are examining the larynx with a mirror held in the mouth, you will notice that the vibrating portion of the cord, is progressively shortened, front and back, as the voice ascends the musical scale. This is done by the internal thyro-arytenoid muscles most complex in their structure. How delicate the mechanism to produce this! It must be done by tension and by shortening. Something may also be due to impact from the expiratory current of air, but not a great deal. You can easily understand that very little difference in the symmetric vibration of the vocal bands would produce a very distinct effect; both bands must vibrate synchronously to make a perfect voice, for the difference between harmony and discord is not very great, where they meet, though different indeed at their extremes. Discordant sounds may be made musical by regulating their pitch, and thus we have the xylophones, glass harmonicas and the like. I remember reading in Radau's "Acoustics," many years ago, a description of a sort of musical instrument used in Brussels during a celebration of the Virgin in 1549. It was composed of twenty cats with voices of different pitch. Each cat was in a box over the edge of which its tail was confined. This cat organ was played upon by a bear, who had been taught how to pull the tails of the cats whose mews thus produced notes or tones, with more or less musical effect. Such an instrument was also constructed by the court jester to amuse the Emperor Sigismund, in order to rouse his depression of spirits. It was sagely remarked by the historian that "the cats were not happy at this epoch." Somewhat like a modern comic opera declares of the life of a policeman. I mention this in order to show that noises of different pitch may be turned into musical effects by adjustment of pitch, just as music can be turned into noise by reversing the process and producing discord. The notes of the gamut are pleasant, struck in succession. Strike them together and you have discord indeed.

Now to apply this to pathologic conditions of the larynx. If we have a congestion of the larynx and more especially if one vocal band only is congested, the voice will be altered in quality. If both bands be congested equally, the alteration of voice may not be so marked as when only one is affected. A uniform congestion of the larynx lowers the tones, so that a baritone may sing more readily when he has a congested larynx than in his normal state. Drinking beer produces temporary congestion; and baritones sometimes resort to this expedient, before singing, in order to lower their register. They do not know why it does so, but they have learned the fact from experience. Many a baritone owes his deepest tones to the glass or two of beer, which he drinks just before singing. His vocal bands become congested and thus heavier. They can be made to vibrate more slowly and thus lower the pitch of the tone.

You may have a little tumor on the vocal band, and if it develop at one of the nodal points, so as to divide the band into two aliquot parts, whether halves or thirds or fifths, there may be no interference with the singing voice; and a singer may use his voice without suspecting that he has such a growth. These little tumors upon the border of the cords are generally symmetrical, and are produced in this way. The patient sings during an attack of congestion. The friction of the cords in vibrating rubs off the epithelium, and this is followed by proliferative inflammation, resulting finally in a cicatrix and the formation of fibrous nodules. Should the growth be at another place than at one of the nodal points, the voice will be more or less altered, just as in congestion, the voice will be more affected when the growth is limited to one side. A small growth may injure the voice for a long time, and if it acquires a thin pedicle it may drop below the glottis and thus improve the voice while the tumor is growing.

There is another very peculiar thing in connection with the production of voice and sound. When listening to music a certain note may thrill you. The physical cause is synchronous vibration of your body which responds to the pitch of the tone. If you take a guitar and so tune it that will vibrate at a a certain pitch, and then take another instrument, and strike a note of the same pitch near it, the first instrument will vibrate in unison, just as the globe in the gas fixture will vibrate sometimes, at certain tones of your voice. Strike the globe and you will find its pitch the same as that of the tune that started it. In the same way heavy bells may be set ringing by playing an instrument properly attuned beneath them; or a suspension bridge may be thrown in vibration, by fiddling continuously upon one string of the same pitch. A company of soldiers in marching across such a bridge are not permitted to keep step, for fear that the vibration may become so great as to destroy the structure. The starting of a big bell is alluded to by George Eliot at the beginning of one of the chapters of her "Middlemarch," a novel in which by the way you will find an excellent description of a cultured physician.

> "How will you know the pitch of that great bell,
> Too large for you to strike? Let but a flute
> Play 'neath the fine-mixed metal. Listen close,
> Till the right note flows forth, a silvery rill:
> Then shall the huge bell tremble—then the mass,
> With myriad waves concurrent, shall resound
> In low soft unison!"

Similarly you can reproduce your voice or your whistle in a piano. Raise the lid, place your foot upon the pedal, so as to keep the hammers from the strings, then pronounce the vowels, or whistle over the strings, and your voice or your whistle will be almost exactly reproduced. Not fully, because the piano is what is termed a "tempered" instrument. The scales between the octaves are not exact and the tones therefore are not exact, but only nearly so. Were they exact, many more strings would be necessary and the instrument would be too complicated to play on. This is one reason of the inferiority of

the piano to the violin in the hands of a master as a means of expression. It is on the same principle that the phonograph is able to repeat the various sounds which are recorded by it.

There is still another attribute of certain voices, which I call "reach." By this term I mean that quality by which the voice is carried to a distance—the penetrating power, it might be called. It is not unlike the power which a ball-player has of throwing a ball to a distance. The voice need not be loud in order to possess this quality, by which it is made very distinct and readily heard. Public speakers and singers often possess this to a remarkable degree. I have heard the whisper of a good actor clear across the theater. When Madame Parepa-Rosa sang at the grand concert in Boston at the great Jubilee some years ago, there was a chorus of 1,200 voices and an orchestra of 1,000 instruments, and yet the tones of her voice were so pure that they could be clearly distinguished among them all, and this in audiences of more than 40,000 persons.

A few words now as to the musical qualities of the human voice, for you may be consulted in reference to them. For practical purposes we distinguish four different varieties of the singing voice:

In the female voice we have soprano and contralto, and in the male voice the tenor and bass. The baritone is a tenor voice which can not sing very high; corresponding with the mezzo-soprano in the female voice.

It will not be necessary to define the terms soprano, alto, tenor and bass. We are concerned particularly with what causes these different qualities of voice. It depends partly on pitch and greatly upon quality. In the first place, it is not due entirely to the size of the larynx. A tall man with a large larynx does not necessarily have a bass voice. I believe that these different voices are due to the resonating bodies in the neighborhood. The natural difference between the male and the female voice is only an evidence of differences in the physical construction of surrounding organs. In man, the respiration is mainly by the diaphragm; in woman, the breathing is costal; in man, the abdomen moves more in respiration; in woman, the upper portion of the chest. The upper air passages are also different in men and women. The larynx is more acutely angular in front in the male, and the rings of his trachea are more semicircular and its membranous portion wider in proportion.

There is one other point which I wish you to bear in mind. It is of immense importance in practice, especially among singers. I have here upon the blackboard a representation of the vocal bands. The thyroid cartilage is incorrectly said to be composed of two pieces; it has three: two lateral wings and one small central portion. It is to the middle section that the vocal bands are attached. Examining the structure of the vocal band, we find that the posterior vocal process passes to some distance into the vocal band. These processes may be pressed together and thus shorten the bands by reducing the vibrating portion. It is thus that the head tones are formed. Of course, when the vocal processes are forced together, only the portion of the band anterior vibrates, and the pitch is necessarily heightened. Therefore, if you will examine a man's larynx while he is singing, you can tell whether he will be able to sing the head tones or not. There is no use in a man's trying to sing head notes, if he has not well-developed vocal processes, for the mechanical requirements are absent. These are well developed in the female and females readily produce head tones. The physical laws which preside over the formation of voice are precisely the same as those presiding over sound of any other kind.

In public speaking or singing, very much depends upon the manner of respiration. If you speak with the abdominal walls relaxed and the diaphragm low down, a larger column of air will be at your command, so that you can produce a greater volume of sound and you can also talk longer than if the abdomen and diaphragm are rigid, and in the latter case you are apt to pitch the voice too high and you will strain the voice, because the larynx is more or less compressed and is not in an easy, natural position. You will sometimes have patients who will speak in a high, falsetto voice, which is the voice of childhood retained in adult life Little boys and little girls have voices so much alike that they can not be distinguished. As the boy approaches puberty, his voice descends an octave, but in the girl the voice only descends a note or two in the scale. When the adult male voice retains its puerile quality, it forms what is called a eunuchoid voice. This effect was purposely produced by castration for church purposes when female voices were not permitted in the choir, forming in fact a male soprano. If a falsetto voice is due to a wrong method of using the voice, it may be overcome by instructing the patient to use the abdominal method of speaking, to which I have already alluded. You may be occasionally consulted with regard to the propriety of allowing little children to take lessons in singing. Of course, it is important that proper methods be taught, and if this be done, I see no reason why children of 8 to 10 years should not be taught to sing, if under good teachers. When a boy approaches the age of puberty, however, no extra work should be put upon the vocal organs until the voice has changed. He should then be taught by a male teacher, for the reason that the pupil will imitate the teacher. For the same reason, girls should be taught by women. The best male teachers, while they give instruction in correct method, have female assistants to train their female pupils.

THE CLASS OF CASES IN WHICH WE MAY EXPECT GOOD RESULTS FROM EXCISION OF THE MEMBRANA TYMPANI AND OSSICLES.

Read in the Section on Laryngology and Otology, at the Forty-fourth Annual Meeting of the American Medical Association.

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The history of the excision of the membrana tympani and ossicles has been brought to the notice of the profession so frequently, that a repetition of these familiar facts would prove tiresome and uninteresting. We should, however, mention the fact that Kessel in 1875, Lueke in 1880, and Schwartze before 1885 performed this operation for the relief of *deafness;* while great credit is due to Sexton, who in 1886, by his courage and skill brought before the American medical world the results of his numerous operations for the cure of *chronic aural discharges;*

and later for the relief of deafness. It was Sexton, therefore, who first proposed this operation, and performed excision of the membrana tympani and ossicles, for the cure of discharge from the ear.

Burnett and others, however, soon followed and by publishing their results, did much to establish this formerly condemned operation and bring it to the almost universal recognition of that part of the profession interested in aural surgery. We are all familiar with the determined opposition this reasonable operation called forth in some quarters. It did, indeed, seem peculiar that advocates of rational medicine should have offered such strong and damaging protests against a surgical procedure which they could not but acknowledge was based on *sound surgical principles;* and especially, did this opposition appear unreasonable, when we remember that these same opponents were acquainted with many unfortunate patients suffering from a chronic discharging ear with its many dangers, which had not only resisted *their* every effort, but had moreover baffled the skill of other specialists.

The great danger to life arising from a suppurative disease of the middle ear is now admitted by all, and surely any procedure proposed for its relief is worthy of due and proper consideration, so long as the treatment thus suggested is not likely to produce bad results, and has for its support the same sound anatomic, pathologic and physiologic backing that has characterized all the noted advances of modern surgery.

Those who have not taken kindly to this rational treatment have declared the operation to be dangerous, and therefore involving too many risks to admit of its becoming popular; to all of which we would ask whether this or any other proper surgical procedure could be more of a daily menace to life, than a chronic discharge from a cavity, the walls of which are composed of plates of bone that are extremely thin, and surrounded by such vital parts as the brain and important blood vessels?

It is certain that a continuation of the discharge favors necrosis of these delicate plates of bone, and thereby induces, through continuity of structure or by direct communication, abscess of the mastoid, septic inflammation of the brain substance and its coverings, or *cerebral abscess*, from which alone there are annually dying in the United States probably four thousand of her inhabitants. At present it is difficult to say precisely just what class of cases are most likely to yield good results from this mode of treatment. Some few cases, regardless of the duration of tinnitus and vertigo or the degree of deafness, will give very satisfactory results. As a general rule, however, it is not well to expect too much improvement of hearing from a chronic, non-suppurative otitis media; and yet, in this class of cases, where tinnitus, pain and vertigo are urgent symptoms, and have resisted other methods of treatment, we should not hesitate to suggest the removal of the membrana tympani and one or more of the ossicles for their relief.

It has not been our custom in the non-suppurative cases to excise the entire membrana tympani unless it is greatly thickened, opaque, and firmly adherent to the tympanic walls. In this class of cases it is interesting to note the large number of patients in which the tympanic membrane presents quite a healthy appearance. It is, however, in just such cases that we remove only sufficient membrane to enable us to excise the malleus, the incus, or both, In this modified operation it is very unusual to have any reaction; and we likewise avoid the pain and suppuration that has at times been reported. By this partial myringectomy, regeneration of the membrane is so slow that at present we can recall at least seven cases in which the original opening has remained for more than two years; moreover, in our experience of over two hundred patients operated on, we are convinced that it is seldom necessary to remove the membrana tympani after regeneration has occurred, unless, of course, the operation had been performed in one of the suppurative cases, and where regeneration of the membrane had confined a dangerous necrosis of the tympanic cavity, or concealed a threatened mastoid involvement.

In order to obtain good results in the suppurative cases, we believe it to be positively essential to remove every fragment of the membrane, as this is the *only* way in which we can hope to obtain free drainage, and procure an opening through which to properly treat the diseased cavity. If the attic is involved it will be found necessary to excise both the malleus and incus, for these bones are very susceptible to carious degeneration, and where either is left behind the suppuration is almost sure to continue; and even if the discharge should cease, it is likely to reappear at any time in the future.

In regard to the operation for excision of the stapes, which has met with such good results in the hands of Dr. Jack of Boston, I can say but little, as my experience with this operation is limited to two cases. Both of these, however, were somewhat successful in the relief of symptoms that had otherwise resisted treatment; but as each of these cases suffered from prolonged staggering vertigo, as sequela of the operation (possibly due to my lack of skill) and as our patients have generally recovered without this procedure, we have found no indication for advising or performing this more formidable operation.

In order to show the benefit that is sometimes obtained from apparently the most hopeless condition, we will review the detailed history of several unique cases, characterized by marked deafness, severe pain, and vertigo, all of which were relieved by operation.

Case 1.—J. K., 39 years of age; ten years ago began to lose his hearing, accompanied by an itching of the external auditory canal. This loss of hearing was in both ears, and continued to grow worse until eighteen months ago when he was suddenly attacked with severe pain in each ear, radiating over the entire head. This pain continued without interruption for nine months, then without apparent cause the pain increased in such violence as to necessitate his going to bed and summoning a physician. Before relief could be obtained he became totally deaf in the left ear. At the end of two weeks the pain was so much better as to enable him to leave his bed. Some pain, however, has continued and now seems to be confined to the right ear. On Jan. 10, 1893, he consulted the writer (bringing a note from the family physician, to whom I am indebted for his previous history).

It is well to state that this patient has never had any discharge from the ear, nor does he remember having had at any time an injury to his head. Except for the inflammation extending along the manubrium, nothing of any importance could be seen to account for his suffering. The mastoid region presented a healthy appearance; the drum, however, was much retracted and firmly adherent to the promontory. His hearing power was nil, through aerial conduction of sound. Bone conduction was about three-fourths normal.

With the hope of relieving the pain alone, we suggested the removal of the drum and ossicles. On Jan. 16, 1893, under ether in the hands of Dr. Pontius, we removed the drum by the circular incision, and extracted the malleus and incus in a piecemeal way, their vitality having been so completely destroyed by the process of necrosis that they crushed to powder under the slight pressure of a delicate pair of forceps. These bones had undergone the several changes which are more forcibly than elegantly expressed by the term "dry rot." I believe that this was the first and only case in the writer's experience where complete excision of the drum was accomplished without any hemorrhage. After operation the tympanum and canal were lightly packed with iodoform cotton and the patient kept quietly in bed. For three days the pain was in no way relieved, although the hearing power was materially improved. From the third day, however, the pain and tinnitus grew less, while the hearing power continued to increase.

On January 24, or eight days following the operation, the pain and tinnitus were so slight as to be barely noticeable. Could hear loud conversation at three feet; tuning-fork and watch were negative in result.

March 12, or about two months after the operation, reports that he has been free from pain, and almost free from tinnitus for two weeks. Hearing power slightly improved. May 16, has not had pain since six weeks following the operation and the tinnitus is now so slight as not to annoy him. Thinks it is growing less each day. Can hear ordinary conversation at six and one-half feet; fork and watch, each, at four and one-half inches.

It is difficult to say why this man should have suffered so severely, for surely the condition as above narrated does not seem to be a sufficient explanation. As regards tinnitus and loss of hearing, we consider this to be fully explained in expressing the belief that a thick drum bound down by adhesions, with ankylosis, or other disease of the ossicles, acts as a foreign body, and as such produces tinnitus and deafness, the degree of which is in direct ratio to the extent of the disease present, and consequent interference with their normal function. We would, therefore, consider the removal of such disturbing foreign elements as not only sufficient reason for the partial or complete restoration of hearing, but it can also be hoped for and reasonably expected that we may secure relief from distressing tinnitus, and oftimes dangerous vertigo.

Case 2.—A. M., aged 16, applied for treatment Aug. 10, 1890. When seven years old had scarlet fever. This was followed by discharge from both ears, which was continuous until the above date. Meanwhile she was progressively and rapidly losing her hearing. Suffered continuous pain, sometimes very severe. Was totally deaf in left ear. After making many and various unsuccessful efforts to arrest the discharge and relieve pain, we suggested the removal of the fragment of drum and malleus. This we performed on Dec. 9, 1890, after which the ear was packed with iodoform cotton, and replaced by fresh cotton every one or two days.

Dec. 20, 1890, no discharge since operation; hears fork at five inches; watch at three inches; ordinary conversation at three feet. Jan. 26, 1891, tympanum entirely dry; hears fork at five inches; watch at six inches; ordinary conversation at five feet. April, 1891, no discharge since operation. Hears watch at six inches; fork at seven inches; and ordinary conversation at twelve feet. December, 1891, slight improvement over the above. July, 1892, hears watch at 10-30; fork at twelve inches; ordinary conversation at fourteen feet.

May 24, 1893, or two and a half years after operation, watch 16-30; fork seventeen inches; ordinary conversation, twenty-seven feet. No discharge since date of operation. Health much improved; performs the duties of life quite as well as if she had never been deaf, or suffered from pain in that ear.

Case 3.—H. D., 62 years old, applied March 10, 1893. Six years ago resided in England, at which time was taken with a severe pain in the right ear, which she thinks came from cold. Never had any ear trouble before, and has always enjoyed good health. Was treated by physicians in England for three years, but received no benefit. Has been in this country for three years and undergone treatment in the hands of many physicians, and as a private patient at several hospitals, without beneficial results.

On March 10 last, or three months ago, she consulted the writer at the Jefferson Hospital; suffering extreme pain and greatly annoying tinnitus. Never had discharge from the ear, but has suffered from severe headache since early adult life.

The drum and external auditory canal on examination revealed nothing abnormal, except some inflammation covering the manubrium. The Eustachian tube was somewhat swollen, but inflation of the tympanum by Politzer's method was easily accomplished. This interference, however, gave her some increase of pain. By aerial conduction of sound she could hear only very loud conversation. Watch and tuning-fork could not be heard. Bone conduction, however, was quite normal. Aside from operative interference it was difficult to suggest or carry out a line of treatment with any reasonable prospect of securing relief, and inasmuch as she had undergone much treatment of the usual routine kind without in any way being benefited, we felt justified in suggesting excision of the drum and malleus, which was performed on March 30, 1893.

For one week following operation she continued to suffer some pain, but it was markedly less severe. On the tenth day a slight discharge of pus was noticed, at which time the pain entirely ceased. The discharge became quite copious three days later. Sixteen days after operation the discharge was quite scanty and the pain returned. A free discharge, however, was reëstablished and the pain again ceased not to return.

April 30, 1893, pain relieved; discharge entirely gone; heard the fork at one inch; watch 3-30; ordinary conversation at six feet. May 10, 1893, tympanum entirely dry; no pain; hears watch at 20-30; tuning-fork at nine inches; ordinary conversation can be heard at normal distance. Patient expresses herself as feeling entirely well; hears everything at church or opera.

Case 4.—E. M., 39 years old: first seen Jan. 15, 1893. When four years old had a severe illness which was followed by a discharge in both ears. This continued until eighteen years old, when the discharge ceased in each ear. Two years later she suffered from severe pain in the left, for one week, when the drum ruptured, followed by the free escape of pus and relief from pain. The running continued for some weeks, then ceased, since which time she had been free from discharge or inconvenience of any kind until two years ago, when her hearing began to fail, accompanied by some "neuralgic pain" in head, and distressing tinnitus. Is now totally deaf to aerial conduction of sound; the osseous conduction being quite normal.

After making unsuccessful efforts for her relief, I advised the removal of the ossicles and drum of the left ear, which we did on March 20, 1893. The operation was followed by considerable discharge for several days, but the hearing began to improve almost immediately, and the tinnitus to grow less. The pain has been entirely relieved.

May 18, 1893. Pain and tinnitus entirely relieved. Hears tuning-fork at ten inches; watch at 4-30; ordinary conversation at two feet. General health, which had been very poor before operation, is greatly improved. Discharge has entirely ceased. Tinnitus and pain effectually relieved.

Case 5.—F. B., age 25. Consulted me Sept. 21, 1889. In 1887 I had treated the sister of this patient for impairment of hearing due to impacted wax, and as she was impressed with the idea that something unusually skillful had been done for her, she informed me of a sister living in Breslau, Germany, who had been deaf from early childhood, and suggested that possibly I might be able to give her relief. She was advised to send for her sister, who presented herself about two years later, giving the following history: has suffered pain ever since she was old enough to remember. At times it was so severe as to necessitate her going to bed, and could only be relieved by the hypodermic injection of morphia. This pain was not confined to the ears, but seemed to be general over the entire head. Does not remember ever having had discharge from the ears. Noises in the head of almost every character were very severe, and caused her great annoyance. She expressed herself as being entirely satisfied if she could be relieved of the pain and tinnitus, as she had given up all hope of ever hearing again. She claims to have been treated without success in Berlin, Vienna, Dublin and London, and to have had a "nerve cut" three different times with the hope of securing relief from the severe pain.

On examination we found the external auditory canal in each ear somewhat obstructed by an accumulation of in-

flammatory products, and very painful to the touch. The drum of each ear was congested, markedly thickened, and so much retracted as to be immovably adherent to the promontory. We found the Eustachian tube obstructed, which, however, promptly yielded to treatment, but without improving the hearing to any appreciable extent. On careful examination of the hearing power she proved to be totally deaf to all sounds, regardless of their pitch or character. The osseous conduction of sound, however, was perfect. Of course the history and unfavorable results of the examination, except for the good bone conduction, compelled us to regard any hopes of improvement in hearing as improbable; however, feeling it our duty to at least make an effort to relieve the pain and tinnitus we concluded to remove the drum and one or more ossicles, as might be necessary. Accordingly on Oct. 3, 1889, we excised the drum and ossicles of the left ear. The patient positively refused to take an anesthetic of any kind because a relative had died under its use. This was the first case of this character that I have ever done under cocain. The pain was quite severe during the operation, but being a woman of determination and pluck, she stood her suffering very well. The malleus and incus both showed evidences of necrosis, and particularly the malleus, which was only about half its natural size, and through necrosis resembled in appearance and structure a piece of dried dead wood that one could with but little force crush between the fingers. The meatus was packed with iodoform gauze and the patient kept quietly in bed for three days. On removing the cotton she said she could hear our conversation and the noises in the street. The tympanum was dry; pain almost relieved; tinnitus much less and patient feeling happy.

Oct. 12, 1889. There has not been a drop of pus; tympanum entirely dry; pain gone, and only a little pulsating tinnitus. Hears the fork at nine inches and watch at 8-30; ordinary conversation at fourteen feet.

November, 1889. All the above good results continue. The patient feels so well satisfied with the results of the operation on left ear that she now makes a request to have the other ear operated on, as the pain still continues in it. This, however, we refused to do at present.

Feb. 6, 1890. Again the patient returned to have the right ear operated on. She was advised to wait a few months longer, so as to ascertain definitely whether the results of the operation on the left ear are positively permanent.

May 9, 1891, or about eighteen months from the date of first operation, the right ear was operated on and a similar condition of the drum and ossicles found. The results of operation were quite as satisfactory.

January, 1892. Patient has been entirely relieved of pain since second operation. Hears perfectly well with both ears. Tinnitus entirely gone. General health excellent and likes America so well that she has concluded to make it her future home.

May 9, 1893. Has been entirely relieved of pain from date of second operation. Tinnitus has not returned. Hearing is entirely normal and all of these favorable results from the operation have been permanent for over two years.

Case 6.—B. S., aged 81. In April, 1888, this patient consulted me for deafness, tinnitus and vertigo. He gave the following history: forty years ago, while exposed to the sun's rays, was suddenly attacked with slight pain in each ear. He became dizzy, fell to the ground, striking his head with much force, and was carried home in a semi-conscious state. For three years prior to this attack had occasionally complained of a "fullness and queer feeling in the head." For seventeen weeks he suffered so much from vertigo as to prevent him from leaving his bed. From the time of this accident, which was in 1848, to the year 1889, covering a period of 41 years, he has suffered more or less from vertigo, increasing tinnitus and deafness. For the past ten years the vertigo would appear without warning and with such severity as to necessitate his having an attendant with him constantly. During this period of ten years the tinnitus has correspondingly increased, and the hearing power in like manner become progressively defective. He was entirely deaf to aerial conduct of both watch and fork; loud conversation could be heard at one foot. In his efforts for relief he consulted many physicians, making three trips to Europe for this purpose. In September, 1889, we suggested the removal of the drum and ossicles. This proposition was accepted with great reluctance on account of his age, and more especially because he had been advised not to submit to any surgical operation. We operated on the left ear Sept. 12, 1889, and found the drum in this case thickened and adherent to the tympanum; likewise the ossicles had undergone the aforementioned peculiar changes due to necrosis. Six days after operation his hearing and tinnitus had somewhat improved; no pain, nor disturbance of any kind followed the operation.

September 27, or fifteen days after operation, he states that nearly all pain and tinnitus has been relieved; has had but little vertigo. October 18, pain entirely relieved; tinnitus much improved; slight vertigo remaining. Nov. 1, 1889, tinnitus and pain entirely relieved. Hears ordinary conversation at seven feet; has had but two attacks of vertigo in three weeks. April 6, 1890, operated on right ear with similar good result.

July 6, 1890, has just returned from Atlantic City, and reports himself as entirely free from pain, vertigo and tinnitus; hears ordinary conversation at sixteen feet; watch at one inch, and fork at four inches.

Sept. 12, 1893, or about three and one-half years since first operation and two and one-half years since the second; has continued in good health except a slight attack of dizziness, which, however, lasted but a few days. Hearing power continues good.

April 14, 1893, has just returned from a trip to the Pacific coast, where he spent the winter and enjoyed good health, being entirely free from tinnitus and vertigo. He hears very much better than men usually do at his time of life.

In the list of 154 operations, which I here offer for your inspection, it will be found that from Cases No. 15 to 84 inclusive, we record 69 patients presenting the non-suppurative variety of middle ear disease. Many of these patients suffered from distressing tinnitus, severe pain, staggering, vertigo, and marked impairment of hearing; while others complained of one or more of these same symptoms in a much less degree. Their ages range from twenty-one to eighty-one years. The time in which the patients suffered from one or more of these symptoms varies from two to forty years, while the time elapsing since the date of operation is from three months to four years. The improvement in tinnitus and vertigo has been in many cases most striking and satisfactory, notwithstanding the little hope that could be offered for their relief in some of the cases before operation. The probable improvement of hearing in this class of cases is, of course, not marked by so many favorable possibilities as in the suppurative variety, and yet a perusal of the carefully recorded results will be convincing that the operation in selected cases is now justifiably demanded. From the results obtained in the class of cases that would properly come under the title of this paper, we beg to offer the following conclusions:

I remark first, however, that this is an age when the public wish to exact from the profession a promise as to the definite outcome of any prospective operation. It is proper and desirable that the *probable* result of an operation under consideration should be fully and carefully explained to the patient and his friends. It is well that this should be done in the presence of your assistants or other auditors. A disregard for this simple precaution has caused some honorable physicians, who have worked hard for the best interests of their patients, to be summoned into court by designing and evil-minded persons, who enter suit for damages because a supposed promise had not been fully realized. We would, therefore, begin our conclusions with:

1. Never promise positive results from an operation on the ear for the relief of tinnitus, pain, suppuration or vertigo. This promise will often be exacted, but the present status of such surgical procedures is not sufficiently well defined to *warrant* us in promising the results which we may hope to attain.

2. Probably no operation in the entire range of surgery (*if carefully performed*) is attended with so little disturbance, either local or constitutional, as excision of the membrana tympani, malleus and incus, when not complicated with necrosis of the tympanum; in fact, there are very few diseased conditions of the human economy that are so apt to be productive of good results as is excision of the membrana tympani and ossicles in certain ear diseases.

3. Tinnitus, vertigo, impairment of hearing and pain are almost certain to be relieved by the removal of the drum and ossicles, if not dependent upon some structural changes in the internal ear.

4. The longer the middle ear disease has existed (as characterized by tinnitus, progressive loss of hearing, pain usually not well defined, and possibly vertigo) the greater is the danger of some serious structural lesion of the internal ear, and therefore the less hope of materially improving the hearing power; and yet even in extreme cases, the tinnitus, vertigo and pain are more or less benefited; sometimes markedly so.

5. If after due and proper efforts to relieve progressive aural diseases, you do not produce a speedy and marked improvement, no time should be lost in performing the radical operation, as by delay an internal ear complication may have become established, and this always makes probable benefit more doubtful.

6. It is not well to express too much hope that the operation will materially improve *hearing* in long standing, non-suppurative cases; and yet, when the chances are so much in favor of its producing entire freedom from tinnitus and vertigo, and especially since there are such great probabilities of a rapidly progressing disease becoming arrested from the date of operation, it would indeed seem unfortunate if such patients were not offered the benefit of this doubt, if such it can be termed.

7. In all cases where the membrana tympani is thickened, markedly retracted, and made firmly adherent by old inflammatory products to the tympanic walls, and where in this same connection you find the ossicles completely ankylosed, the function of these parts under such circumstances is of course entirely suspended; therefore in consequence of this condition, this part of the conducting apparatus can be regarded only as a foreign body, and, as such, the only rational hope for relief is through removal; which will in the majority of cases relieve tinnitus and vertigo, while, at the same time, improvement in hearing can reasonably be expected on account of the opening thus formed admitting the sound-wave which impinges directly on the stapes and fenestra rotunda.

8. As a preventive of necrosis of the temporal bone, mastoid abscess, aural polypi and serious brain complications (when the result of chronic aural discharge) the *suppurating* ear should *not* be allowed to continue and thus become chronic. If, therefore, under the usual methods of treatment the discharge does not permanently yield, it is certainly good and I might say imperative surgery, to promptly extract all fragments of the membrana tympani and necrotic ossicles; for in so doing you have taken the only rational step to obtain a cure of this always dangerous discharge, by first removing all foreign matter and thereby establishing a free drainage, and furthermore giving an opportunity of properly treating a diseased cavity that otherwise would be inaccessible; and, inasmuch as the writer has not met with any failures in this class of cases (when unaccompanied by extensive necrosis of the tympanic cavity), he is forced to express the belief that *timely surgical interference* can not be too strongly urged, for by so doing you eradicate the primary disease, and thus prevent these always serious, and ofttimes fatal complications.

MUCOCELE AND EMPYEMA OF THE ETHMOIDAL CELLS AND SPHENOIDAL SINUSES.

CAUSING DISPLACEMENT OF THE EYEBALL.—THEIR OPERATION FROM THE ORBIT.

Abridged from a Paper Read before the Section on Laryngology and Otology, at the Forty-fourth Annual Meeting of the American Medical Association at Milwaukee.

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The liquid which distends the accessory cavities of the nose may be serous, mucous and purulent. My remarks will be confined to the ethmoidal and sphenoidal sinuses which form a group themselves, though their affections frequently extend to the neighboring cavities and vice versa.

Only one sample of serous exudation has come to my notice, and that was not from my own practice, but from Dr. Robert Abbe's, who, April 8, 1893, was kind enough to send the patient to my clinic for an opinion, to invite me to the operation and permit me to use the case and his notes for this paper.

Case 1.—Distension of all the accessory cavities of the nose by a sero-hemorrhagic exudation with cholesterin. The patient, a girl of 16 years, had some trouble with her sight when in school. Always had headaches. Intellect clear. Three years ago first noticed fullness on her eyes and exophthalmos, with impairment of sight in the left, which is now completely blind. The sight of the right is going fast, but she has fairly good vision in a limited field. Has mouth breathing from partial obstruction of the posterior nares.

I gave, as the probable diagnosis, mucocele or empyema of the ethmoidal cells and sphenoidal sinuses, which by encroaching on the orbit caused the exophthalmos and blindness. I advised an operation from the orbit. This was done by Dr. Abbe, May 15, 1893. He first punctured the tumor from the left orbit with an aspirator needle and obtained a brown watery liquid containing a large quantity of cholesterin. He then made a curved incision along the upper and nasal border of the orbit, opened the tumor and liberated a very large quantity of chocolate brown fluid, saturated with cholesterin. All the sinuses seemed to have coalesced. With a finger introduced from the orbit into the ethmoido-sphenoidal cavity he could feel the point of a catheter pushed through the mouth against the anterior wall of the sphenoidal sinus, which wall he incised with a curved bistoury, and passed a strip of iodoform gauze from the orbit into the naso-pharynx, thus establishing perfect drainage. The operation was followed by moderate fever, the strip of gauze was soon removed and the sinuses cleansed with water which was injected into the orbital wound and escaped into the pharynx. The secretion diminished to almost nothing; the eyes protruded less; the sight of the right eye seemed to improve somewhat and by June 5 the girl walked about and was in good general health.

Case 2.—Mucocele of the ethmoid cells. Operation from the orbit. Recovery by first intention. Miss H. Joseph consulted me June 12, 1888, on account of protrusion of her left eye. She had had difficulty in her left nostril for which she had been "burned" repeatedly. I found the nasal passages free and without marked swelling of the walls. The superior-inner wall of the orbit was bulging, hard, displacing the

NOTE.—By way of parenthesis I may mention that the lacrymal sac could be reckoned among those cavities. It empties into the nose, it has an erectile tissue at its outlet into the naso-lacrymal duct. Its diseases originate almost always in the nose, not in the eye, show the same pathologic changes and are treated on the same principles as those of the nasal cavities. They belong to the sphere of the rhinologist, as well as to that of the oculist.

eye. Interior of eye and sight normal. She consented to an operation five months later. I made a curvilinear incision, laid the tumor bare, incised its wall and evacuated water and mucus. The cavity was explored with a sharp spoon, and as there was no caries or granulation tissue present, no scraping was done. Irrigation with corrosive sublimate, 1-5000; insertion of a silver drainage tube. Wound syringed and dressed every day. Almost no secretion. Tube left off on the seventh day. The tumor and exophthalmos disappeared. There was no diplopia and no abnormality of motion of the eye, but the skin above the wound was anesthetic for six months. The patient has been seen several times since. The recovery is complete and permanent.

A similar observation was the following:

Case 3.—Empyema of the ethmoidal cells, operated from the orbit. Speedy and complete recovery. Mrs. R. W., age 55; had suffered from pain in the left eye and surroundings for two months. No marked symptoms on the part of the nose. Exophthalmos down and out. Sight and motion of eye good. In upper-inner corner of the orbit a hard tumor reaching down to the ligamentum canthi internum. Operation Nov. 3, 1892. Curved incision laying the tumor bare. On opening of its wall escape of much pus. The sharp spoon discovered a cavity three centimeters deep, with bare and rough walls which were scraped. On probing no communication with frontal sinus, which had been suspected, was ascertained. Syringing with bichlorid of mercury, 1-5000; insertion of a drainage tube. On fourth day some swelling and painfulness in region of wound and behind eye, followed by evacuation of a great deal of pus. Recovery since then undisturbed. Tube removed on twenty-first day. Exophthalmos and orbital swelling disappeared. Eye normal; no diplopia. Was last seen seven months after operation; well in every respect, except some insensibility of left frontal region.

Affections of the ethmoidal sinuses are mostly complicated with like affections of the ethmoidal cells, as the two following examples will illustrate:

Case 4.—Empyema of ethmoidal and sphenoidal sinuses. Opened from the orbit three years ago. Discharge and fistula ever since, though improving. Exophthalmos cured. P. J., a lad of 13, consulted me Aug. 1, 1888, on account of protrusion of left eye, progressing steadily the last three months. No marked symptoms from the nose. The eye was pushed towards the temple, but freely movable. In the upper half of the inner wall and the upper-inner corner of the orbit a hard roundish tumor about the size of a cherry. Not until April, 1890, did the patient consent to an operation. The tumor and exophthalmos had increased. Sight and visual field normal, but optic nerve raised and the retinal veins enlarged, showing pressure on the optic nerve, presumably from the bulging walls of the sphenoid. Opening of the tumor liberated a great quantity of inoffensive, brownish, puriform liquid. A probe penetrated two and one-half inches into the depth of a cavity, there being stopped by bone tissue, evidently the posterior wall of the sphenoidal sinus. Syringing brought out more of the coffee-brown puriform substance. Two drainage tubes had to be inserted, and up to this day they have been worn and the cavity syringed, which always brought yellowish-white, puriform secretion. Four months after the operation, when there was no diminution of the secretion, I sent the boy to Dr. Lincoln, one of our best rhinologists, who treated his nose, also made an opening into the ethmoidal cells. The boy left off this treatment as it did not seem to have much influence on the discharge from the wound. He has come to me at longer or shorter intervals. I saw him last two weeks ago. The exophthalmos and the tumor have disappeared and there is no discomfort except the necessity of keeping the two tubes in place and syringing the cavity daily. The secretion has of late become very scant and the liquid injected into the orbital wound escapes through the nose, so that there is some hope of an ultimate recovery. The silver tubes have blackened the skin around the fistulous opening. I advised him to replace them by gold ones.

Case 5.—Empyema of the ethmoidal and sphenoidal sinuses. Operation from the orbit. Thus far (four months) persistence of external fistula, but with diminishing secretion. Sam. H., age 15, consulted me Dec. 12, 1892. For many years has had offensive discharge from the nose, and, for the last three years, exophthalmos of varying degree on the left side. Eye pushed downward and forward. Sight, visual field, tension, mobility and interior of eye normal. Naso-pharynx nothing abnormal except some swelling of the middle turbinated body. Hard tumor in inner-upper part of orbit. Opening as in the other cases Jan. 26, 1893. Evacuation of a great quantity of brownish muco-pus. Interior of cavity rough; scraped with spoon. Five days later, swelling of region of wound with stoppage of discharge. February 3 I reopened and enlarged the wound, and made it deeper. A good deal of muco-pus and blood escaped. A new cavity, evidently the sphenoidal, had been opened, for the probe penetrated two and one-half inches straight backward. The middle turbinated was swollen. There has been a gradual diminution of the exophthalmos, the tumor and the discharge. Patient feels comfortable and the injected liquid frequently flows into the nose and pharynx.

Case 6.—Exophthalmos with rapid loss of sight from empyema of the sphenoidal sinus. A strong, healthy-looking gentleman, C. K. D., age 50, came to me Feb. 18, 1887. He said that three months previously, after a prolonged exposure and fatigue, his left eye protruded down and out; the lids were swollen; the sight had diminished, first in the center, then on the sides, and in four days was lost completely. The protrusion of the eye began to diminish five weeks later. I found the eye still prominent, but free from pain. No abnormality in orbit discoverable. Optic disc white, arteries small, pulsating on pressure. I was puzzled as to the diagnosis. A year later I was informed that a rhinologist in Washington, D. C., while working in the interior of his left nostril, suddenly evacuated a great quantity of pus. Now I was certain that the patient had had empyema of the sphenoidal sinus which, by an acute exacerbation, had caused sudden or almost sudden blindness by optic neuritis or pressure on the optic nerve in or near the optic foramen, a rare disease of which a few cases only are on record.

In conclusion, I beg to report another example:

Case 7.—Empyema of all the sinuses which terminated fatally by meningitis. The patient, a stout woman of 57 years, came to my service at the Vanderbilt Clinic Jan. 3, 1893, with a greatly swollen upper lid inner-upper corner of orbit and lacrymal region, and down and outward exophthalmos. She had suffered long from naso-pharyngeal catarrh. I plunged the knife deeply into the inner-upper part of the orbit, liberating a great deal of pus. The probe penetrated into the ethmoidal cells and into the left and right frontal sinuses. The cavity felt smooth, was syringed out and drained. The patient, who had fever, was admitted to the hospital (New York Ophthalmic and Aural Institute). The fever continued. At first there was secretion through the wound, then it stopped, the temperature rose to 103 and 104, the pulse to 130 and 140 and the patient died suddenly Jan. 15, 1893.

The autopsy showed purulent meningitis at the base and convexity. The pus communicated through the cribriform plate of the ethmoid and defects in the roof of the orbit with the nose and the ethmoidal and frontal cells. All the sinuses contained this pus and had white even walls with scarcely any mucous lining. One-third of the left malar antrum was filled with pus. Necrosis was seen nowhere, but caries in many places, also on the surface of the left turbinated bone.

REMARKS.

Reviewing these cases we find the different kinds of exudation represented.

The first (Dr. Abbe's), illustrates a serous exudation. Such cases were formerly described under the name of hydrops antri, etc. They are apt to fill different sinuses and break down the partition walls in and between them. The liquid they contain is commonly chocolate brown and saturated with cholesterin. It is probably a conversion, a retrogressive metamorphosis, of the sero-mucous exudation.

The second case was a plain and pure mucocele of the ethmoidal cells. Primary union followed the opening and cleansing of the cavity.

The same happy termination was noticed in the third case, though the contents of the cavity were more purulent than mucus. Such issues may be expected in acute or subacute cases, where there is neither caries nor necrosis and polypi. It is remarkable that the accessory cavities are not more fre-

quently the seat of retained liquids than we are aware of, for their orifices are mostly small and all situated in the upper portions of their walls. The reason of this, it seems to me, is that the exudations disappear, not so much by evacuation as by absorption, as soon as their source, the productive inflammation, has ceased. Collections of pus in the anterior chamber of the eye quickly vanish when the corneal abscess spontaneously or by surgical interference has ceased to exist. It is well known that during acute coryza the neighboring cavities fill with secretion which disappears when the coryza is over.

The fourth and fifth cases were empyemas of the ethmoidal and sphenoidal sinuses in which the operation cured the exophthalmos and the tumor, but the secretion has continued though diminished in quantity. The peculiar puriform secretion showed under the microscope the elements of pus, but bacteriologic examinations failed to find microbes.

The sixth case, exophthalmos with rapid blindness, is very important and certainly rare. In literature several such cases are mentioned, but I know of no other example in my own experience. I imagine that empyema of the sphenoidal sinus may exist for a long time without producing eye symptoms; then suddenly, as we see in chronic dacryo-cystitis, an acute abscess develops which makes the tissue in the apex of the orbital pyramid congested and edematous, participating in the inflammation and causing blindness by optic neuritis or orbital cellulitis, compressing the blood vessels in the orbit, with subsequent retinal hemorrhage and thrombosis as we see in erysipelas, of which I described and depicted a marked case. (Archives of Ophthalmology, Vol. xiii, p. 83). The periodic edema of the sub-conjunctival tissue, accompanied by more or less protrusion of the eyeball—which for want of a better diagnosis is called tenonitis—may also be caused by transient inflammation of the sphenoidal sinuses or posterior ethmoidal cells. Under all circumstances it is well for oculists to keep this possibility in mind. The case under consideration had been diagnosticated by nobody, though it was seen by many.

In the seventh case, empyema of all the sinuses, the pus had evidently made its way into the cranial cavity through the cribriform plate and defects in the upper plate of the frontal sinus before the patient presented herself. The operation came too late.

I abstain from making any remarks about the diagnosis and prognosis of the ethmoidal and sphenoidal sinuses, as they are well enough treated in most text-books, and some excellent modern monographs.[1]

The treatment of these diseases is very important, as a spontaneous recovery has scarcely ever been observed, whereas surgical treatment is free from danger, benefits almost all cases and produces a permanent cure in many. Care of the nose, if there is disease, should not be omitted. Even when exophthalmos is present, rhinologic measures should be more extensively tried than heretofore. The ethmoidal cells may be opened from the middle meatus, where a pointed instrument at the hiatus semilunaris will readily penetrate into the anterior cells, producing in many cases an opening large enough for the evacuation of liquids and subsequent irrigation. In others, the perforation has to be made through the upper meatus, mostly after partial removal of the middle turbinated, especially when its medial wall is conspicuously bulging (Zuckerkandl's bulla ethmoidalis). The same holds good when the sphenoidal sinus has to be opened. The openings into the cavities should be large for they readily close again. The interior of the cavities should be carefully probed and caries, necrosis, and polypi treated with a sharp spoon. Operating in the depth of the nose is particularly difficult and tedious on account of the narrowness of the canals and the abundant hemorrhage, in spite of cocain. The operation from the orbit, by a curvilinear incision, has the great advantage of offering a clear view on the diseased parts. These parts can then be readily exposed, punctured or incised, and according to the exploration, irrigated, scraped, and drained. An opening into the nose may be useful. In the cases which I have seen to end fatally, the meningitis had mostly set in before the operation.

The division of the frontal nerve leaves anesthesia for months, but is of no consequence. Injuring the superior oblique muscle would produce diplopia. It never has occurred in my practice and I do not think that the accident is difficult to avoid. The expansion of the os planum and lower wall of the frontal sinus by the accumulated muco-pus crowds the pully away from the nose, so that a curvilinear incision along the orbital margin does not interfere with the tendon or pully of the muscle, as the anatomical specimen which I pass round demonstrates.

In conclusion, gentlemen, let me say that the subject which I have taken the liberty to submit to your consideration, has an old, but widely scattered literature; yet not until very recently has it been systematically studied. The impulse to this study has not been given by general surgery, nor by ophthalmology, but by the highly gratifying development of modern rhinology.

[1] Berger and Tyrman: Die Krankheiten der Keinbeinhöhle u. des Siebbeim labyrinthes. Wiesbaden, 1885, and L. Grunwald: Die Lehre von den Naseneiterungen. 1893.

THE CURABILITY OF NASO-MUCOSITIS.[1]

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PART I.

The Way the Question is Put.—It is unprofitable to discuss an undefined subject. To ask one to build a house without giving its dimensions is not consistent with business principles, because the amount of work to be performed can not be estimated. To ask one as to the curability of a chronic disease without giving the age, physical condition, etc., of the patient is just as inconsistent.

"Can you cure nasal catarrh?" is the universal form in which this question is put, by both the laity and the medical profession; in the former it is excusable; in the latter it is not. The question is asked precisely as one would ask about the removal of a corn from the foot, showing plainly an ignorance of the fact that the disease is found in various conditions, each of which must influence the ultimate result in any special case.

On one occasion in a medical society, about fifteen

[1] The term, "naso-mucositis," is formed from the word mucosa, the mucous membrane, with the usual termination, "itis," that indicates its inflammation, and the prefix naso-, which limits the inflammation to the nasal passage.

years ago, a well-informed medical man, one who is a literary graduate as well, and a professor in a popular medical school, and who lectured every season on diseases in general, including a few lectures on diseases of the air passages, asked me kindly: "Are you sure that you can cure nasal catarrh?"[2]

I replied: "Are you sure you can cure pneumonia?" He asked: "What is the age of the patient? What is the stage of the disease?" I replied: "What is the age of the patient afflicted with nasal disease? What is the grade of the inflammation?" His answers indicated that he did not know that nasal inflammation assumed various grades, or that these grades, determined by the age of the patient, etc., cut any figure in the length of time required for treatment, or affected the curability of the disease.

As questions of a similar character are constantly being asked, I propose to give full answers to all such. These answers will include the question of curability of every variety of the disease. Every one old enough to ask these questions, should exercise judgment enough to know that an infant suffering from an affection of its nasal mucous membrane must have a different degree of inflammation from that of a person 20 years old, and that the nasal inflammation in this latter person must differ greatly from that of a person in old age.

It is seen that to answer the question as to the curability of this disease, the various conditions, such as age, habits, customs, etc., which form the grades of the disease, must be given, so as to know—as in the case of the construction of the house—the amount of work and reparation the physician and *vis medicatrix naturæ*, respectively, has to perform.

The Mechanism of Naso-Mucositis.—I contend that naso-mucositis is the result of irritation of the sensory nerves alone by some means (this excludes heredity), and that this irritation is principally occasioned by exposures to cold and by excesses (tobacco and stimulants),[3] affecting the integumentary and mucous surfaces. The connecting links between these surfaces, and the blood vessels, are the sensory nerves on the one hand and the sympathetic nerves on the other.

The sensory nerves of the integument, or of the mucous membrane, or both, first receive the irritation; they transmit it to the cervical sympathetic ganglia; second, this produces a paresis of the sympathetic nerves that leave these ganglia to supply the blood vessels of the mucous membrane of the nasal passages, etc., resulting, third, in more or less enlargement of all these vessels. This enlargement is the inflammation—is the naso-mucositis.

I have said that the paretic effect manifests itself on the blood vessels in the mucous membrane of the nasal passages; this is true, but the blood vessels of other portions of the head also are affected at the same time—maybe not to the same extent—such as the eye and the brain.

It is also evident, that as the effects of colds are transferred through the sensory and sympathetic nerves from the skin to the capillaries of the mucous membrane of the air passages, that if this membrane is maintained in an inflamed condition for a number of years, it will, reflexly, affect the skin from the nerves of the air passages, as we see in the dry, scurfy skin of the consumptive, and the enlargement of their finger nails, known as club-nails.

Phases of Naso-Mucositis.—An outline of the various phases of this disease, from infancy to old age is here given, sufficient to afford an opportunity for observing its gradual increase, forming various grades, and for observing the extension of the disease from the nasal passages—the locality in which it *uniformly* commences—into the Eustachian tubes and middle ears, the throat, bronchial tubes and lungs, the ethmoidal, sphenoidal and frontal cavities, ultimately reaching the brain through these cells; frequently affecting the eyes, stomach and heart. This will do much toward defining the disease, which, as I stated at the commencement, is essential to the proper discussion of its curability, and will also afford an opportunity of presenting important facts that are paramount in indicating the proper course and length of treatment for the various grades.

Infancy.—Attacks of naso-mucositis are so very common during some portion of infantile life that one would not be far wrong in saying that all infants suffer from it in a mild or severe form.

In the earlier stage, the mucous membrane of the nasal passages *alone* is affected. There is no evidence of systemic perturbation until the nasal inflammation has progressed from six to fifteen hours, a sufficient length of time for the disease to assume a severity that will affect the body generally. Soon after the cold is taken, the mucous membrane pours out a large quantity of mucus. In a few hours the membrane becomes so much swollen that the passages are completely occluded. It is at this time of infantile life that middle ear troubles frequently occur. When the nasal passages are completely filled with swollen mucous membrane, the excessive secretion, which is fluid, is held, as it were, to the mouths of the Eustachian tubes, so that it is drawn into these canals and into the middle ear by the rarefaction of the air in the tympanum, where its irritating property produces inflammation of the middle ear, and afterward rupture of the membrana tympani.

In proportion to the number of infants affected with nasal inflammation, the number whose Eustachian tubes and middle ears are affected is comparatively small. A very unfortunate circumstance connected with ear trouble in infancy is, that many times neither the mother, nurse, nor the family physician has observed any symptoms of ear trouble until perforation of the membrana tympani had taken place. It requires just such criminal oversight as this to prepare patients for the deaf and dumb asylum.

The anterior portion of the inferior turbinate is all that is seen. In all infants that I have examined, I have not seen the least evidence of any deflection of the septum nasi, and rarely is there any evidence of enlarged tonsils.

Rapid Recovery of Infants.—If proper care is taken, all evidences of inflammation will soon disappear. The rapidity with which many infants recover from severe colds and the many severe sequelæ following these colds is such that not infrequently the complaint will pass out of the mind of the parents in a few years, or until some future recurrence of the illness brings the previous diseased condition to mind.

[2] I knew that he doubted its curability, for he had informed me a few days previously that at that time he was unsuccessfully endeavoring to treat members of his own family who were sufferers from this complaint.

[3] After the naso-mucositis has affected the stomach, an attack of indigestion will so debilitate the system, that a cold will result from an exposure, which, if the stomach were in a more healthy condition, would not have injuriously affected the patient.

To repeat, all these subjective symptoms are proofs that the infant is suffering severely in consequence of attacks of cold in its *nasal passages alone*, the result of insufficient protection of the body, especially the head. Very frequently the child's system is weakened either by over-feeding, or excessive covering of the middle portion of its body. This debility—which is called the pre-catarrhal stage by some—prepares the system, so that it is liable to take cold on less exposure than that which would affect a healthy child.

Childhood.—If an infant, subject to exposures, as are all infants, takes slight colds frequently, and survives and attains the age of childhood, its nasal passages, Eustachian tubes, throat and maybe its lungs will be so weakened that it will easily have attacks of nasal inflammation. It will be liable to suffer from tonsillitis, earache and consequent deafness, weak eyes and headache as soon as it commences to go to school. If the nasal inflammation has been severe and prolonged, it will prevent the proper growth of the child. Inspection of the child's nasal passages with a good light, will give abundant evidence of much more severe and longer continued disease than that of the infant. Frequently the inferior turbinate is not very large, not proportionately as large as it was in infancy, but the middle turbinate is about one-fourth larger than the inferior turbinate. If the inflammation has extended into the antrum of Highmore, as it is usually seen in cases in which the inferior turbinate is not enlarged, then crusts will be observed to form upon the upper surface of this turbinate. Cases of this kind are usually placed in the category of "atrophic catarrh," but this is a serious mistake as will be demonstrated further on. In these patients the tonsils are frequently observed to be enlarged, or rather there are enlargements on the tonsils.[1]

The curability of the two grades mentioned above will depend as much, if not more, upon the observance of the rules of hygiene as upon any local applications that can be made.

Youth of both sexes are very apt to contract what seems to be a primary attack of naso-mucositis, also due to ignorance on the part of their parents and to their own carelessness. If the attack was a primary one, almost no treatment would be required, for a healthy mucous membrane would throw off the disease in a few days, but, as in the case of those in childhood, so with the youth, they have for many years been taking slight colds; these have passed out of mind, but they have weakened the mucous membrane, so that they take cold easily and oftentimes severely. The severe cold is the one that causes them to visit the physician.

The young woman of 17 years of age is usually insufficiently and imperfectly clad, resulting in colds being frequently taken. This is especially the case during the winter season, upon the attendance of operas, theaters, lectures, etc. This is the age in which young women are very liable to functional interruptions of a very serious nature.

The brother of this young woman, who may be two years younger than she is, demands and gets twice the weight of clothing that she wears, of a better character and more properly distributed. He would be sick in two weeks were he compelled to wear her unprotecting, irrational garments. One reason that he is stronger than his sister is, because he is dressed so warmly that his system is not debilitated by the effects of colds. His food goes to the formation of muscle instead of the production of heat as in her case. Also, he does not suffer as the girl does from garments that unnaturally constrict the body.

Why is such a strong young man a sufferer from nasal inflammation? Principally because he commits excesses in the use of tobacco, alcoholic stimulants, and in keeping late hours, etc. All forms of dissipation are peculiarly conducive to naso-mucositis and to aggravation of the dangers of ordinary exposure.

Partial Atrophy of the Mucous Membrane.—The mucous membrane of the nasal passages of patients of this age will bear evidence of still longer continued and more severe inflammation than that of the younger grades. By this time the inflammation of the inferior and middle turbinate processes has been so severe as to produce partial atrophy of the mucous membrane covering them, thus providing more space in the nasal passages than in the case of the infants, for the secretion formed there. This is the reason why we have very few cases of acute inflammation of the middle ear in this grade; the secretion has an opportunity to flow away from the Eustachian tubes, which is not the case when the nasal passages are filled with swollen mucous membrane, as in infancy, as already mentioned.

Tenacious Secretion.—Instead of the secretion being fluid, as we see in the younger grades, in this grade, and in all succeeding grades, the secretion covering the inflamed membrane is tough and exceedingly tenacious. This secretion adheres to the inflamed surface with such tenacity that it can hardly be removed with a brush and will resist the effect of warm water for a long time. In the older grades this stream is observed flowing down the back portion of the pharyngo-nasal cavity, frequently causing excessive gagging spells in the morning. It is in this grade, in youth of both sexes, that we first see curvature of the septum nasi.

Inspissated Secretion.—If crusts are formed, it is due to the flow of secretion not *from* but *upon* the turbinate processes, as before stated. In this place of lodgment it is inspissated by the heat of the nasal cavity.

Atrophic Mucous Membrane.—It seems self-evident that an atrophic mucous membrane can not form secretion as rapidly as a mucous membrane that is not atrophic; that is, one that is simply swollen. In an atrophic condition the blood vessels and glands are atrophied. How is it, then, that these debilitated glands pour out a greater flow of secretion than will mucous membrane whose glands are not debilitated? The mucous membrane that is simply swollen will not allow a crust to be formed on its surface, for the reason that the irritation occasioned by this thick, partially decomposed flow, that forms the crust, would cause the membrane to pour out sufficient fluid to wash off the thick secretion before the crust is formed. Again, while a swollen membrane has sufficient heat to cause inspissation, its secretion, being of a fluid nature, would wash the thick secretion off its surface. The dryness of an atrophic membrane allows the thick secretion to remain on

[1] It is my opinion that these enlargements, which have been called hypertrophied tonsils, are growths upon the tonsils and not hypertrophied glandular substances.

its surface and the heat of the cavity inspissates it. The method of proving positively that these surfaces do not form the crusts is the following: a small quantity of cotton is laid gently upon the seat of the crust and allowed to remain there twenty-four hours. It will be seen that the crust is formed on top of the cotton, demonstrating plainly that the secretion that formed the crusts flowed *upon* the turbinated processes. The atrophy of this process, therefore, has nothing to do with the formation of the crusts, except that of giving it a dry, non-secreting place for lodgment.

Overgrowths.—Long-continued inflammation in the septum nasi is the cause of the superabundant growth which we term, deviation of the septum. If the inflammation had not maintained a larger quantity of blood there than normal, this larger quantity of blood would not have occasioned this overgrowth or curvature. This is true also of enlarged turbinate processes, showing plainly that these overgrowths are due to long continued naso-mucositis.

Middle-Aged and Elderly Persons very commonly suffer from naso-mucositis and in its most severe form. When the disease has been contracted in infancy, or a little later, it has been aggravated continually by all the causes above mentioned throughout a long period, during which time it has made steady progress, while at the same time, the constitutional power of resistance and reparation has diminished in inverse ratio.

The mucous membrane of these two grades is found in various conditions, but it is nearly always in an atrophied condition, yet not one in a hundred of them will have crusts formed upon the turbinate processes.

Common Mind Troubles.—In patients of these grades, the extension of the inflammation from the nasal passages to the brain, through the ethmoidal, sphenoidal and frontal sinuses, resulting in common mind troubles, is one of the most common and one of the most troublesome symptoms that the physician is called upon to relieve.

GRADES.

From the foregoing it appears that the naso-mucositis, as seen in the child, requires the inflammation of the severity that occurred in infancy, with the supervention of additional colds to form it; and that the inflammation, as seen in the nasal passages of youths, requires the severity and continuance of the disease as seen in infancy and childhood, plus additional colds to form it also. This appears to be true of all grades of this complaint; and whether its curability is rapid or slow will depend upon the grade. Of course there are a few exceptions to this formation of the grades as will be mentioned hereafter.

The age, the susceptibility of the patient, the medicaments employed, and the means of employing them, all of which have a controlling influence, unite in forming *five grades* of naso-mucositis, embracing a period from infancy to old age. Of these factors the most important is age. Notations carefully made in several thousand cases, occurring in private practice, during seventeen years, from 1875 to 1891, have plainly demonstrated:

1. That the *causes* of the disease at one age vary in their effects upon the mucous membrane from those of another age.

2. That the *diseased condition* of the various parts involved varies at one age from that of another.

3. That variations exist in the *symptoms* of patients of different ages.

4. That the length of *time* required for *treatment* varies according to age.

5. That the *curability* and *ameliorability* of the disease presents the same variations as regards age.

It is thus seen that the causes, the diseased condition, the symptoms, the number of treatments, and the curability, all vary according to age.

Age not always the Guide.—It is sometimes seen that young patients must be classed in grades more advanced than would be indicated by their age. For instance, I have a young patient not over ten years of age, who must be classed in the fourth grade, because of the severity of the inflammation and the abnormal growths in his nasal and pharyngo-nasal cavities. This inflammation has disabled his eyesight, caused imperfect speech, consequently affected his brain, and has prevented his growth. Again, I have had patients of from thirty to forty years of age, with inflammation not more severe than those about twenty years old. Such instances, while not very rare, are not sufficient in number to disturb the gradation.

The Five Grades of Naso-Mucositis are as follows: *first grade*, from infancy to the third year of age; *second grade*, from the third to the tenth year; *third grade*, from the tenth to the twentieth year; *fourth grade*, from the twentieth to the fortieth year; *fifth grade*, from the fortieth year upward.

I do not mean that there are five different kinds of naso-mucositis, but that there are five grades of the same diseased condition. The lines of demarcation between the grades are not of a marked character. They blend into one another much as do the colors of the solar spectrum. If we should divide human life into infancy, childhood, boyhood, mature and old age, we would not mean that there were five different kinds of human beings, but five different epochs or ages. So it is with the different ages or grades of naso-mucositic inflammation. A course of treatment that will cure an infant will not be proper for a patient in childhood, nor will the course that cures a patient in childhood be successful for one of an older grade, and so on through all the grades. It will be seen, as we investigate the subject, that the liability to "take a cold," and its curability, is constantly in a certain relationship to the degree in which the mucous membrane is inflamed. It might seem from the foregoing that all patients were first affected at the same age, namely, infancy. While a very large proportion, indeed, a very great majority of patients are so affected, yet such is not all of my meaning. What is meant, is that the age indicates the strength and the rapidity of the reparative powers. The younger the patient the stronger and more rapid the repairing processes.

The Conditions that Control the Number of Treatments and Their Period.—The length of time required for treatment of naso-mucositis must be varied according to age, temperament, habits, severity of the disease, etc., of the patient, that is, according to its "grade." If the ears or eyes are involved, or the turbinate processes are enlarged, or the septum nasi is deviated to the extent of partially occluding one or both nasal passages, or there exists an ozena, or vocal disability, as any imperfection of pronunci-

ation of words—which is really a brain trouble—or if the saliva flows from the lips, or the mouth is habitually open, or the memory has lost its retentiveness, or the mind can not be applied studiously without producing disagreeable sensations in the head, etc., the local applications and constitutional treatment will have to be lengthened. If the voice has been weakened, or has been uncertain in singing, or is wearied upon use, improvement in these respects upon treatment should soon be observed. The same should be noticed as to the memory and the ability to study. If the breath has been affected, as in ozena, a very *guarded* promise of recovery must be given, as this is a very hard phase of the disease to control. I have had cases that I could not cure, even after over ten years of fall and spring treatments; once in a while a case seems to be beyond management, except while under more or less continuous treatment.

(*To be Continued.*)

THE TREATMENT OF DIPHTHERIA.

Read in the Section on Diseases of Children at the Forty-fourth Annual Meeting of the American Medical Association.

BY F. E. WAXHAM, M.D.

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It is to be hoped that in the not far distant future the inoculation treatment of diphtheria will supersede or largely displace all other treatments. The researches in the field of bacteriology; the discovery of the Klebs-Löffler bacillus and the various experiments with ptomaines and anti-toxines are most assuring. Yet notwithstanding the fact that Bering and Kitasato have clearly demonstrated that cultures, which will invariably kill susceptible animals in very small amounts, have their toxic properties entirely destroyed by the addition of the blood of an immune animal; and while the experiments upon animals have been such as to give us confidence in the future treatment of the disease by inoculation, yet for the present we must rely upon the well-tried methods of to-day.

While mice inoculated with a virulent filtrate, neutralized by the addition of immune blood have remained immune to diphtheria for forty or fifty days, yet this method has not been employed in the human subject. There are still great difficulties to be overcome and much experimentation still to be done before this treatment can be applied to man. We ascribe all honor to the investigators who have already accomplished so much and look to them with interest and hope for the future.

I shall not occupy your time in discussing the preventive treatment, important as it is, for it would only be to reiterate principles that are perfectly familiar to all.

In considering the treatment of this disease we may for brevity, confine our remarks to four headings: 1, nourishment; 2, stimulation; 3, internal medication, and 4, local antisepsis.

In the treatment of this disease, nourishment is quite as important as medication, and the life of the patient often depends, not only upon alcohol, oxygen and the local use of antiseptics, but upon proper and abundant nourishment as well. On account of the energetic employment of various remedies, the importance of feeding is often overlooked. We sometimes neglect to inquire explicitly in regard to the amount that is taken, and we frequently find that very little is given when we had supposed that the child had been receiving a sufficient amount. On account of the loss of appetite and the pain of swallowing, a patient often refuses all nourishment: and there is sometimes an insane repugnance for all food, which can not be overcome by ordinary means. In these cases we should at once resort to forced feeding. We should endeavor at frequent intervals to give some nourishment by the mouth, while peptonized food should be given by enema. If a patient absolutely refuses all nourishment by the mouth I would emphasize the importance of introducing a small gum elastic catheter into the stomach by way of the nasal cavities.

After the introduction, a safety pin should be passed through the end of the catheter to prevent its slipping beyond reach. It may be allowed to remain as it gives rise to but little irritation, or it may be removed and re-introduced at each feeding. It, however, should be removed two or three times daily and cleansed and the nasal cavities flushed with a warm alkalin antiseptic solution. Milk and stimulants in full quantities can be introduced through the catheter by means of a syringe, and I am convinced that many lives may be saved in this manner that would otherwise perish.

There are those who oppose the idea of alcoholic stimulation in the treatment of this disease, but I believe it is the judgment of the profession generally that it is a very important remedy. While mild cases do not require its use, yet in severe or malignant cases it is imperatively demanded. It is a well-known fact that alcohol is one of the most potent destroyers of microörganisms in culture fluids. Its benefit in diphtheria is undoubtedly due to its antidotal action upon the ptomaines in the blood. In no other way can we explain the fact that alcoholism is not produced, even when it is given in large quantities. When required, it should be given freely; at least one or two teaspoonfuls of whisky or brandy or its equivalent of alcohol, every hour or half hour, according to the urgency of the case. In severe or malignant cases, other stimulants must also be given, as strychnia, musk and ammonia.

In regard to internal medication, there is one remedy that stands out preëminently above all others. While so-called specifics have come and gone, this one, the tincture of the chlorid of iron, has remained as one of our sheet anchors in the treatment of diphtheria. No one claims it to be a specific, yet it is a fact that red blood corpuscles increase amazingly under full doses of this agent, hence its usefulness as an internal remedy, while its local effect as an astringent and antiseptic increases its efficacy. It should be given in frequent and full doses; ten, fifteen or twenty drops to young children, all that the stomach will tolerate, and it should be repeated every hour or half hour. Should it disturb the stomach, carbolic acid should be combined with it.

There are other remedies, such as bichlorid of mercury, turpentine and chlorate of potash, that have been much used; but in very severe cases of pharyngeal diphtheria I believe they are too irritating to the kidneys and should be employed with caution. In laryngeal diphtheria, where the kidneys are not fre-

quently involved, however, the bichlorid of mercury is the most useful remedy at our command.

The local antiseptic treatment of diphtheria is of the utmost importance. It matters little what antiseptics are employed, providing they are thoroughly applied to the throat and nasal cavities. Carbolic acid, bichlorid of mercury, pyoktanin, chlorin water and peroxid of hydrogen are agents that have frequently been employed with more or less success. The results, however, will depend, not so much upon the remedy selected, as upon the method employed. To spray the throat with the most effective antiseptic, leaving the nasal cavities uncared for will only invite failure; while to use an antiseptic solution that does not thoroughly irrigate the whole nasal tract will be inefficient.

The bichlorid of mercury is undoubtedly one of the most powerful germicides at our command, and in the strength of 1-4000 is not irritating. The peroxid of hydrogen diluted to one part to four of water is also efficient, but its use should be followed by a warm alkalin douche. When the spray from a hand atomizer will reach the whole nasal tract it is to be preferred to the douche, as there is no danger of forcing the fluid into the middle ear. This accident which will occasionally result from the too forcible use of the douche is an unfortunate one. One of the most effective methods of treating the nasal cavities is by means of the soft rubber catheter, as first suggested by the President of this Section. This should be introduced along the floor of the nasal cavities until it reaches the post-nasal space when, by means of a small syringe, a warm, alkalin antiseptic solution can be gently introduced and the whole nasal tract thus thoroughly irrigated. The advantages over the atomizer are obvious for when the nasal cavities are obstructed the spray simply rebounds and the deeper parts remain untreated. I would advocate the early use of the douche in this manner in all cases of diphtheria where there is the slightest tendency to invasion of the nasal cavities.

It seems proven beyond doubt that the disease is primarily a local one, and that the constitutional symptoms are the result of ptomaine poisoning; this poison being produced by the bacilli which are found in countless numbers in the diphtheritic exudate. How necessary, then, that the local treatment should be most thorough and efficient. To recapitulate: the indications in the treatment of diphtheria are to destroy, as far as possible, the bacilli by the thorough and early use of our most powerful germicides; to support the system and prevent the disorganization of the blood by abundant nourishment, free stimulation and full and frequent doses of iron.

PREVENTION OF DIPHTHERIA.

Read in the Section on Diseases of Children, at the Forty-fourth Annual Meeting of the American Medical Association.

BY J. LEWIS SMITH, M.D.

NEW YORK, N. Y.

The physician, when summoned to a case of diphtheria however mild, should never neglect the manifest and very important duty of preventing, so far as possible, its propagation to others. Effectual measures to this end are within his power. Dr. H. B. Baker of Michigan, has published statistics, showing that in 102 outbreaks of diphtheria, the average number of cases, where disinfection and isolation, one or both were neglected was 16, and the average deaths 3.26, while in 116 outbreaks in which isolation and disinfection were enforced, the average number of cases in each outbreak was 2.86, and the average deaths 0.66. Therefore prophylactic measures prevented 13 cases, and 2.57 deaths in the average for each outbreak, in the total 1,545 cases and 298 deaths. These statistics relate to one year. (*Annual of Universal Medical Science*, 1888.)

The remarkable success achieved by Prof. Grancher in preventing the propagation of diphtheria, so that of 153 patients not having diphtheria, admitted by mistaken diagnosis among diphtheritic patients, not one contracted the disease is noteworthy. The following are the measures so successfully employed by him: a metallic screen surrounds the bed occupied by the patient, and all spoons used by him, forks and napkins, are immediately disinfected by being placed in boiling water, containing sodium carbonate, about one ounce to the pint. The bedding and the clothes used are disinfected by heat and the floor, bedstead and walls are washed with corrosive sublimate solution. Nurses and medical attendants wear blouses that are disinfected by heat each day, and they bathe themselves with a solution of corrosive sublimate or a 5 per cent. solution of carbolic acid. The success obtained by Dr. Grancher, in a public institution, by such prophylactic measures easy of application, justifies the belief that it is possible by their early and continuous application, and the intelligent coöperation of families to limit each outbreak of diphtheria to one or a few cases.

Prophylactic Measures to be Employed in the Sick Room.—Usually, when the physician is summoned to a case, the diagnosis has not been made. If diphtheria be suspected or ascertained, the physician should before entering the sick room, remove his coat and vest, and cover his neck, body and extremities with a blouse as Dr. Grancher recommends, or a sheet fastened around the neck. It is necessary at the first visit, to examine the fauces, in order to make the diagnosis, and at subsequent visits in order to ascertain the progress of the disease. In examining the fauces, most physicians sit in front of the patient, and in depressing the tongue a cough is usually excited, so that particles of muco-pus or of psuedomembrane if it be present, are likely to be ejected upon the face, neck or chest of the physician. These infected particles, however small, may communicate diphtheria to others. Not long since a New York physician, who examined a case with me, seeing the precautionary measures which I employed, stated that they recalled to mind a painful personal experience. A patient, whose fauces he was examining, coughed in his face, and he was conscious at the time, that something lodged in his beard, but his attention being directed to other matters he forgot to bathe his face and beard with a disfectant, and returned home. His child of three years came to him, and after the usual incubative period, sickened with a fatal form of diphtheria. It is not difficult to examine the fauces of a child standing by his side or behind him, so as to avoid to a great extent the danger to which I have alluded. It has also been proposed to examine the fauces through a pane of glass, set in a convenient frame, which would allow a good view, and intercept any ejected particles of muco-pus or pseudomembrane.

I need not repeat the judicious advice of many

writers on diphtheria, that all articles not needed for use by the patient should be removed from the sick room, such as the carpet, curtains, pictures and decorations, and no one not absolutely required should be admitted into the room. The bathing of other children of the household with an antiseptic wash, disinfection of their throats and nostrils, the change of their apparel and their removal to a distant part of the house, or better to another house, are also properly recommended as precautionary measures. When the physician has completed his examination and is about leaving the family, he should bathe his head, face, beard and hands in an antiseptic lotion, and during the subsequent hour or two he should avoid close proximity to other children if it be practicable.

The suppression of diphtheria in rural localities, with intervening lawns or gardens between the domicils, and with only one or two families in each domicil, seems comparatively easy with the intelligent coöperation of families, but in a large city like New York, with its constantly increasing pauper population, and crowded tenement houses, the prevention of diphtheria is very difficult, perhaps impossible. The difficulties in the way of prevention may be seen by the following case, which is by no means exceptional:

On a midwinter day, I was requested to visit a sick child of a poor deserving family. On arriving at the number I found a five story tenement house, so common in the poor quarters of New York, and learned on inquiry that Mr. G., whose child was sick lived on the third floor. Feeling my way along the narrow passages, dark even in the daytime, I was admitted into the sick room, ascertained by subsequent measurement to be 12x14 feet. The occupants of the house were Mrs. G., pale and careworn, and in her arms an infant of about two years, whose guttural respiration was audible as soon as the door was opened. Its nostrils and cheeks were sore from the abundant acrid discharge and a large indurated swelling on each side of the neck extended from the ear downward. A moment's glance without nearer approach, was sufficient for the diagnosis of malignant diphtheria, with a fatal termination not far distant. The child had been sick four days, and without a physician on account of the destitute circumstances of the family. Through a half-open door, leading into a bedroom too cool to be safely occupied, I saw three children silently gazing at their mother. They reminded me of the penned sheep or calves in the East Side slaughter houses, seeing their companions one after another led out to slaughter, and quietly and resignedly awaiting their turn. The mother said that she had two other children who were attending a public school, and were at home, except during school hours. When questioned in regard to the origin of the disease, she stated that she was not aware of any exposure to a case of diphtheria, but offensive odors due to escaping sewer gas were often noticed in her apartments. Since this case of diphtheria was reported, examination of the plumbing throughout the house has been made by the Health Board, and it is found to be of the old style in all parts of the building, and entirely inadequate to exclude the effluvium from the sewer. This escape of the sewer gas is a constant source of peril to the twenty-two families occupying the house. The child that I visited lived two days. This case is related in order that we may perceive how difficult it is to prevent diphtheria in the large cities, with their tenement houses crowded with poor families, who frequently do not send for the physician or know the nature of the disease, until diphtheria has continued several days, and many have been exposed. It will be recollected that two of the children in this family, constantly exposed when at home to malignant diphtheria, were attending without change of clothing, one of the public schools during the continuance of the case.

Since many cases of diphtheria originate from exposure in places of public resort, especially in the schools, the protection of children in such places is a matter of very great importance. The New York Health Board, no doubt, prevents many cases by excluding from the schools all the children coming from a domicil in which an infectious disease is occurring, as soon as it is reported, but more stringent measures are required.

Dr. Augustus Caillé recommends the daily examination, by a competent person, of each pupil on his entering the school, and the exclusion of any one who has a sore throat, nasal catarrh, or blennorrheal ophthalmia. He also recommends that each pupil be questioned whether there be sickness at home. Certainly, thorough and searching measures must be employed against so insidious a disease if its propagation be arrested in a large city with its numerous tenement houses.

Clinical observations have demonstrated the efficiency of the preventive measures related above, but additional measures to procure prompt disinfection of the air of the sick room are required. For this purpose, I have for years prescribed the following disinfectant, and believe that it aids materially in achieving the desired result:

℞ Ol. eucalypti. . . . . ℥ss
Acidi carbolici. . . . . ää ʒi
Terebinthinæ . . . . . ʒvii.
M.

One tablespoonful of this mixture is added to one quart of water, and is allowed to simmer constantly near the patient. Since these agents are volatile, they may also be employed without heat in the manner recommended by Dr. Charles Smith of Australia. He saturates with them towels placed on papers upon the bed of the patient or near him. He states that patients who constantly inhale the vapor thus produced, and recover, do not have subsequent paralysis, a remark which corresponds with my observations. The disinfection of the infected apartment, after the termination of the case, by burning sulphur in a moist air, as practiced by Health Boards, and the painting or calcimining of the walls and ceiling before the room is again occupied are still to be recommended, notwithstanding the prophylactic measures previously employed.

OBSERVATIONS ON ISOLATED CASES OF DIPHTHERIA.

Read in the Section on Diseases of Children, at the Forty-fourth Annual Meeting of the American Medical Association.

BY W. A. DIXON, M.D.
RIPLEY, OHIO.

Diphtheria is a frequent and most destructive disease, a large and familiar outlet of youthful life. Children of tender years are specially susceptible to it, and no condition of life seems to materially influ-

ence the liability to the disease. The rich and the poor, alike, suffer severely from it.

Sanitary conditions, as a matter of fact, seem to have little to do with its prevalence. Though most writers characterize it as a filth disease, a view of its history shows that it pays little regard to filthy or cleanly surroundings.

Dr. Thursfield's observations as sanitary inspector of a district in England extending over twelve hundred square miles, show the number of fatal cases of diphtheria in the rural portion to be nearly three times that in the urban.

Dr. Longstaff at another period, in his report on the "Geographical Distribution of Diphtheria in England and Wales," shows that the disease was twice as fatal a malady in rural districts as it was in towns.

Dr. Buchanan has pointed out "that it has always displayed a marked tendency to prevail in sparsely populated districts rather than in centers of population."

Many authorities could be quoted to show that it prevails to a more alarming extent in country districts than in cities and towns in the Old World. In this country, it prevails as frequently on the hilltop, in the clean and salubrious farmhouse, as in the valley or in the crowded city tenement houses, reeking with filthy squalor and nauseating vapors.

As far back as 1735 and further, we have recitals of the disease appearing in inland towns of New England, and spreading thence gradually to the thoroughfares, and by the lines of travel till it reached the larger towns and cities. This is the history of its outbreak and spreading, through all the past years to the present. It often breaks out in an obscure locality, in an elevated situation, in a remarkably healthy place, in different families without any previous observable cause. In some families practically isolated from every discernible source of infection, it passes like a plague through all the children. As it spreads, and is conveyed from family to family, the further it gets away from the original outbreak, the milder in type it becomes, until some writers upon the features of the same epidemic differ as to its real nosology. Those who see it early in the outbreak, see a veritable plague, a malignant diphtheritic membranous croup horribly fatal in its ravages.

Off in the towns and cities, which by halts and steps it has reached, having passed every obstruction interposed to arrest it in its course, it comes to the children so modified by its many transmissions, it bears about the same relation to the original as varioloid does to variola, and dies out as an ulceromembranous angina, or some other less fatal throat affection.

Since observations extending over a long period of time, and embracing so many countries besides our own, go to show that country districts suffer more than populous cities; that it attacks the young in the most sequestered situations and without a possible communication with the diphtheritic sick; that these situations are apparently free from all the conditions of milk, sewage, filth or other infection likely to develop the disease, we must look for a source in some other direction.

Many authentic instances of the association of diphtheria in children and domestic animals are recorded, tending to show the relation existing and its communicability from the lower animals to man. The reports of the local government boards of epidemiological and pathological societies are replete with statistics showing the relation.

Dr. Greenhow cites the coincidence of diphtheria with certain diseases among cattle, as portrayed by Drs. Brocklesby, Hurd and Layard, early in the seventeenth century.

Dr. Ghizi says: "There was a great resemblance between the epidemic angina, which prevailed at Cremona in the years 1747 and 1748, and a disease affecting the respiratory passages at that time, prevailing among oxen." He quotes many writers of that period who were "persuaded that the epidemic sickness amongst animals, and diphtheria prevailing, was of the same nature."

Severinus, who wrote in the seventeenth century also mentions, that a great mortality among cattle preceded the appearance of malignant sore throat. Dr. Thorne quotes the observations and experiments of Drs. Low and Klein in England, as late as 1888, illustrating the connection between diphtheria in children and in cats.

In our own country, Jacobi says: "Probably the possibility of contracting diphtheria directly from animals, is very much greater than the danger from water or milk. If that be so, many obscure cases, endemic or epidemic, will admit of a readier explanation than at present." He cites many observations of physicians upon diphtheritic infection of children from calves, lambs, parrots, pigeons and fowls. The correctness of their deductions is strengthened by their finding in each case the diphtheria bacillus.

Dr. J. Lewis Smith in the "Cyclopedia of the Diseases of Children," says: "Observations are accumulating which show that diphtheria, or a disease closely resembling it, occurs among animals, and is sometimes communicated from them to man," and cites instances of epidemics in different localities, introduced by turkeys, pigeons, rabbits and other animals, establishing pretty conclusively the origin of the epidemics mentioned to be from the diseased animals and fowls in the locality.

Since, therefore, distinguished observers have admitted that diphtheria is sometimes contracted from the lower animals, I am encouraged to hold from observations in my own practice, extending over a period of more than twenty-five years, that isolated cases in the country and also in the towns and cities, may be accounted for, in a similar if not identical sickness of animals, fowls and birds prevailing at the same time and in the immediate vicinity.

The profession might profitably give more attention to this subject, because the intimate association existing between children and animals may be the fruitful source of many diseases other than diphtheria. In the rural districts the animals generally receive as much if not more consideration than the children. Children can and do in some measure care for themselves. Nothing is spared in the management and care of animals and fowls.

The association between domestic animals and fowls on the farm and the children is intimate. When the animals are sick they instinctively appeal for help, and endeavor to get as near their protectors as possible. The sick cat will be in the house, on the rug, and in the arms of the children if possible. The caged sick birds claim and receive devoted attention. The sick fowls are brought from their

roosting quarters and cozily put to bed in a corner of the sleeping room, or around the cooking stove in the kitchen. This occurs in good families, in well-to-do families in the country, and oftener than physicians suspect. If there is communicability of diseases from animals to man at all, it is therefore no surprise to find them prevailing to a greater extent in the country districts, where animals and fowls are so numerous, and kept in such close association, than in the cities and towns.

I will give a few instances of isolated cases of diphtheria out of a great number I have observed, to show that it is reasonable to conclude that the children were infected from the birds, fowls, pigeons or cats mentioned in each case. No claim is made to indisputable correctness. In no case was the membranous deposit microscopically examined. The ordinary methods only of a plodding, artless country doctor were resorted to, which were convincing.

In 1865, diphtheria prevailed as an epidemic in the section where I was practicing in Southern Ohio. It was malignant in character and very fatal in its ravages. Preceding and during this period, there was great fatality among the hogs and chickens in all that region. Farmers are aware of the contagiousness of diseases among the stock, and are generally careful to note their presence, knowing well that the infective matter, whatever it may be, lingers long on their farms after the epidemic has passed by. Many of the most prudent have learned to entirely cease raising stock so affected, for a time, in order to get rid of the disease. They do not seem, however, to understand the communicability from animals to man as they should. It is also observable that great fatality prevails among the rabbits, pigeons, cats and even rats at times.

So far back as 1865, I had but slight conviction of diphtheria being contracted from animals, and gave the subject very little attention. As time passed on, however, and anxious parents so often cornered me into answering how their children could contract a contagious disease like diphtheria in their isolated and protected condition, I began to look for a more tangible and reasonable cause than infected air, bringing it long distances to select tender children for victims. Hence these observations and conclusions.

In 1865 I saw many cases in children living in the country, perfectly isolated from diphtheritic sick. They had no opportunity in any way to be infected by other children. In the family of Mr. G., a well-to-do farmer, the children were seized suddenly with violent and malignant symptoms of diphtheria. The chickens on this farm were sick and dying with a disease affecting the throat. To care for the chickens well, as they sickened they were brought to the house and given a corner in the kitchen, where most of them died. The children spent most of their time with the sick chickens. The first child seized died early with laryngeal stenosis. The remaining three recovered, but each had characteristic paralysis following, and were long in recovering.

Another case was a child in the family of Mr. S., whose home was perfectly isolated. The child had no possible chance of infection, living far from any case of diphtheria. This child had a pet cat, which it nursed continually. The cat had been ill some days prior to the child's attack and had a discharge from the nostrils. The eyes were sore, it coughed and sneezed. The glands of the neck were enlarged. It died about the time the child was taken sick. In this neighborhood, hogs and chickens also were dying at this time, of a disease the farmers called cholera. The child exhibited all the symptoms of malignant diphtheria, with extensive membranous deposit, and enlargement of the cervical glands, and died within seventy-two hours of laryngeal stenosis.

In the family of Mr. F., living on a high hill, in a secluded locality, the children were seized with well-marked symptoms of diphtheria, malignant in type. This instance is notable, because at the time there were no cases of diphtheria in all the country about. The children were really isolated in the strictest sense. The family had canary birds. The birds were sick; some of them died. Paralysis supervened in one or both feet of those which recovered. The fowls on the premises also were sick, many dying of a similar affection. It is reasonable to conclude the children were infected from the birds and fowls.

The following year I met with true diphtheria in the family of Mr. M., living in an out-of-the-way place, thoroughly secluded from contagion, unless from sick and dying fowls.

In 1869, a farmer, Mr. K., had a large number of hogs die of what was called cholera. At his request, I visited his farm and found about thirty hogs well fattened, dead, and many more sick. They were taken with a cough, humid breathing, and had discharge of frothy mucous from the nostrils and mouth. They rested on their bellies, with their feet drawn up under them. Many of them had difficult breathing and crowing inspiration. We opened the thirty dead hogs to obtain some clearer idea as to the character of the disease, and found in each, inflammation of the larynx, granular infiltration, spots of ulceration, and patches of membranous deposit. In many, the trachea was inflamed and quite filled with exudation. In some, inflammatory products in the lungs. Very few showed any lesion of the alimentary canal. This malady among the hogs was followed by an epidemic of true diphtheria in all that region, and by severe sore throat without membranous deposit.

In quite every year from that time forward, I have noted instances of diphtheria in isolated homes in the country, where malignant sickness occurred among the animals. I have frequently examined chickens which died during epidemics, and invariably found destructive inflammation with membranous deposit in the throat, and have observed recovering fowls suffering from paralysis.

Recently my convictions have been so strong in favor of this animal infection theory, that I invariably inquire about and examine into the condition of the animals belonging to the place where children so isolated are taken with diphtheria, and rarely fail in discovering a source in some pet bird, fowl, cat or diseased stock on the premises. I could state many instances noted in the last few years, and out of that number will give a few of the most striking ones of recent date:

In April, 1890, a young son of Mr. S. was taken violently ill with unmistakable diphtheria. There was no case anywhere in the country about, so far as known. On the way to the residence, a healthily situated farm house, in a pasture on an adjoining farm dead and sick hogs could be seen. At the residence it was found that the chickens were affected

with a very fatal disease. The little boy's pet pigeons were sick; some of them were already dead. One or two sick ones had been brought into the house to receive good nursing. The boy was devoted in his care of them. They exhibited every evidence of throat disease, but were not examined critically as should have been done to make conclusions indisputable. The boy passed through the various stages of typical diphtheria and convalescence seemed assured, when paralysis of the muscles of deglutition supervened. It being impossible to nourish him artificially he died of starvation.

The next case occurred in January, 1891, in a boy five years old, the son of Mr. M., who lived on a farm in a healthy location with the best of hygienic surroundings. There were no cases of diphtheria in all the region about. The symptoms and conditions present were beyond all doubt those of malignant diphtheria. The boy died on the seventh day, without any abatement in symptoms from the beginning. To account for the source of infection, investigation revealed that the boy had a pet cat which he nursed and played with much of the time. My associate, Dr. A. W. Francis, assisted in the examination of this cat which was killed for this purpose. We found the cervical glands enlarged and suppurating, the mucous membrances of the throat deeply inflamed with abundant membranous deposit, extending far into the trachea. Also patches of ulcered membrane covered with muco-pus emitting an offensive odor. We satisfied ourselves that the cat had true diphtheria, and that the boy had contracted the disease from the cat by immediate contact.

In October, 1892, Mr. W., living on a high hill in a secluded place, most healthy in all its aspects, early one morning reported his only child, a little girl, aged ten years, to have had croup during the night but was then better. Dr. Francis prescribed for it. In a few hours the father returned reporting the child worse. When seen half an hour later, it was found in extremis with tonsils, uvula and pharynx all covered with diphtheritic membrane, and extending into the larynx producing stenosis. The condition forbade surgical interference and the child died in an hour from complete closure of the larynx.

This child had three pet cats which she nursed, played with and made her constant companions. The cats were sick, had cough and sneezing, a discharge from the nose, and died a few days before the child was taken sick. We were, therefore, deprived of the opportunity of examining them.

In November, 1892, Mr. H., living in a secluded place, on a hill farm with good surroundings, and perfectly isolated, reported his son eight years old had croup during the night. Dr. Francis saw the boy soon and found a case of true diphtheria with membranous deposit and slight difficulty breathing. He determined to open the trachea; and if possible save the boy's life, by an early operation. He therefore returned to the office for instruments and assistance, and hastily returned, to find the patient dead. Investigation as to a source of infection revealed again the presence of sick cats, exhibiting symptoms of sore throat.

There is no reasonable way to account for the infection in all the cases mentioned, except we accept the animal infection theory. It would require extraordinarily strong proof to dissuade me from the convictions expressed in this paper.

SOME OBSERVATIONS ON TREATING CASES OF DIPHTHERIA.

Read in the Section on Diseases of Children, at the Forty-fourth Annual Meeting of the American Medical Association.

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There is, perhaps, no subject at this time exciting more and deeper interest in the profession, certainly there is none more important than the management of cases of diphtheria. In this connection some general remarks seem necessary with reference to the ravages of the disease. The excess of deaths over births, which is depopulating the French nation to-day, is largely due to diphtheria. In England it is not confined to the large cities alone, but the rural districts are feeling its scourge.[1] The same may be said of the United States, where there is a growing dread of the disease and justly so, because of the gradual increase of cases, and deaths as well, which quite an extended correspondence with the different State Boards of Health, also the mortuary registers show, conclusively proving two things: 1, its infectiousness; 2, that the general efforts now put forth to stay its progress are inadequate.

As to its infectiousness in man, this has long since been settled in the affirmative and the question now is, What creature is not subject to the disease? since flying fowl, creeping beast, as domestic animals or pets, are susceptible, and like flies have the credit of conveying the disease. The cat's ability to contract and transmit diphtheria to persons has long been observed.[2] Animal susceptibility to inoculations with diphtheria exudate and cultures of the same, has frequently been utilized; making them the experimenting ground by which important data have been obtained; settling the question as to whether diphtheria is primarily a local, or a constitutional disease, in favor of the former. This has been proven by the elaborate investigations of Wood and Formad, Klebs, Löffler, Abbott, Welch and many others. But for the specific cause of the contagion we are indebted to Löffler for his discovery of the diphtheria bacillus, which bears his name. And no less important are the investigations of Abbott and Welch, who have established the fact that in the Löffler bacillus, we have the etiology of diphtheria, a factor of paramount importance in regard to its rational treatment and prophylaxis, again to be referred to.

With reference to the present effort not being adequate to stop the progress of the disease, we have to say that while this is true generally throughout the States, we are glad for one single exception which stands out conspicuously and alone, and is worthy of our respect and emulation. We have reference to Michigan and its State Board of Health, backed as it is by legislative enactments, not only requiring scientific investigation of disease and tabulating the same, but by an enforced system of isolation and disinfection, which had reduced, in 1889, the average number of cases per outbreak from 11.66, in which isolation and disinfection was neglected, to 1.56 when it was enforced, and deaths were reduced from 2.65 to .22,[3] showing very plainly that the

[1] Thorne Thorne's Work. England.
[2] Noah Webster's Epidemic and Pestilential Diseases.
[3] Restrictions and Preventions of Diphtheria. Michigan State Board of Health. Printed 1892.

disease can not only be controlled, but that there is a possibility of stamping it out entirely. Until other States are guided by the State of Michigan, they will continue to write large bills of mortality; which brings us to the vital question of

ISOLATION.

In the management of cases of diphtheria, after what has been said it seems unnecessary at this late date and time to do more than refer to the excellent restrictions and preventions, even to minute details, issued and gratuitously furnished by a number of the State and local Boards of Health. But the great necessity is to have *enforced isolation*. Isolation, if not efficient, is no isolation at all. For instance, to quarantine the house is not isolation, when there is only a board fence or a wall to scale, between the quarantined and coveted liberty. Neither is it isolation, even against the physician's protest, for a mother of a poor family to separate and nurse one of her children sick with diphtheria in a down stairs, badly ventilated room, from the vitiated atmosphere of which she emerges to supply the others with the food which the husband is compelled to be absent to provide; for soon the whole family becomes a prey for the disease. To meet such an emergency one of two things is necessary: a nurse must be provided by the health authorities, or the patient removed to a hospital adapted especially for contagious cases. Hence the great need for the latter, and provision for the former. Therefore, to have efficient isolation we must have the State's legal enactments and popular support, as well as public and private coöperation, all of which will follow in the wake of an enlightened judgment and a just appreciation of the great responsibility which one individual owes to another, and the public at large.

In view of the importance of isolation, as well as the trouble and inconvenience attending, the questions arising, What cases shall we isolate, and how shall we discriminate? are immediately forced upon us. Some cases of sore throat having an exudate are contagious and some are not. Under such circumstances it is always safe, particularly during an epidemic, to look upon all such with suspicion and treat the same as diphtheria, at the same time securing some of the exudate for microscopic examination, to determine as early as possible its true character.

The Klebs-Löffler bacillus is the only microorganism always and persistently present in the exudate which, if found, establishes the diagnosis.[4] To do this satisfactorily will require a microscope with a one-twelfth oil-immersion objective, and in some cases the bacillus may be detected by simply straining from one-half to three-fourths of an hour a film of exudate previously spread on a cover-slip in a 2 per cent. aqueous solution of gentian violet, wash in a 5 per cent. solution of acetic acid, then in distilled water, dry in air and mount, preferably, in Canada balsam.[5] This plan, however, may be confusing just at a time when it is desired to be positive. To establish which, the inoculation of a culture fluid with a portion of the exudate will be necessary, which, after about eighteen hours in the incubator, if successful, will under the microscope reveal the character of the bacillus, which culture, if desired can be used to ascertain its pathogenic properties by inoculating a rabbit or guinea pig. If the practitioner is fortunate enough to possess a good microscope, culture incubator and other appliances, he may possibly settle the question in doubtful cases. If not he should send a sample of the exudate on clean, white paper, securely bottled, to a competent bacteriologist, who can in twenty-four hours determine its nature. Every Board of Health should have such a salaried appointee to carry out such investigations. It having been determined that the case is one of diphtheria the patient is isolated, if he has not already been, in the upper story of the house which has been previously cleaned and divested of all drapery, upholstery, carpets and everything excepting the barest necessities for the proper care and comfort of the patient, and at the disposal of the attendants, for more than one will be required in severe cases.

They should be furnished with one or more large pails containing a 1-1000 disinfecting solution of corrosive sublimate, into which bed linens and garments of whatever character should be immersed before taken from the room. Being free from the rattle of tin, two marked papiermaché basins, one to contain the disinfecting solution before mentioned, as the best in our judgment, and the other for water convenient for the attendant's ablutions after necessary contact with the patient. Two or more covered chamber buckets, one always near containing a quart or more of a solution of chlorinated lime in strength of half a pound to a gallon of water, for the reception and disinfection of alvine dejections and promptly removed from the room, but allowed to remain in the bucket two or more hours before emptying into the closet. In this connection there should be a liberal supply of towels and soap with a view to the absolute cleanliness of the person and the surroundings. A spitting cup containing an 8 per cent. solution of carbolic acid to receive the secretions and expectorations from the mouth, throat, lungs and nose; or a better plan is to receive such material on soft muslin rags, toilet paper or small squares of cheese cloth, and immediately burned. Hence, the necessity in the room of an open grate, or stove, in which such expectorations can be cremated. Such secretions being the most infectious, because, containing the diphtheria bacillus, should be most carefully guarded and utterly destroyed. In absence of an ordinary stove, a gas or perhaps the objectionable coal oil stove, on which, with a view to prevent dryness of the air in the room and to disinfect the same, a vessel containing the following should constantly be kept simmering, a modification, we believe, originally suggested by Dr. J. Lewis Smith, N. Y.:

R	Ol. cinnamoni.	30 parts.
	Ol. eucalyp	180 "
	Acid carbolic.	220 "
	Ol. terebinth	420 "

M.: Use one ounce to a quart of water.

An adjoining room should be appropriated to the use of the attendants, to the door of which needed supplies should be brought, and from which disinfected articles be removed for further disinfection with boiling water. The visits to the kitchen by the attendants, where other members of the family are, perhaps children, should not be allowed. To, or in, this room provisions can be brought and prepared as

[4] Annual address on the causation of Diphtheria, by Wm. H. Welch, M.D. Transactions of Medical and Chirurgical Faculty of Maryland.
[5] Löffler's Method.

ordered for the patient, which brings us to the subject of

FOOD.

In order to support the strength of the patient, the proper nourishment is a matter of the most vital importance. Though anorexia is generally persistent, systematic feeding should be instituted early, and of such character as is suitable to the age and condition of the patient. Fluid nourishment being most tolerant to the stomach; as milk, warm or peptonized, cold milk, beef juices expressed from broiled beef, beef peptonoids and other food more concentrated, as eggs, soft boiled, eggs and milk; and when stimulants, which are required early in severe cases, eggs and milk beaten up with brandy, also milk punch, should be judiciously given.

In those cases where there is an unwillingness, or as is frequently the case, an inability to swallow nourishment, enemata of the articles just mentioned should be resorted to early, freely and continuously, until convalescence. This can not be emphasized too forcibly, for by the early and continued support and maintenance of the vital powers, we thereby assist nature to resist and withstand the septic influence of the disease, and thus we often accomplish more than by over-much medication.

LOCAL TREATMENT.

The necessity for seeing diphtheritic cases early, can not be over-estimated and in our judgment should justify the request, on the part of the family physician, for a speedy summons in time of sore throat epidemics especially; for success in a great measure will depend upon the local treatment being employed early, vigorously and with a view to destroying the diphtheria bacillus and preventing the absorption of the poison, now known to be tox-albumen. To accomplish this desirable result in

PHARYNGEAL DIPHTHERIA:

First, disinfect the throat; and second, remove the exudate as fast as it forms.

To accomplish this, begin by spraying the throat with a 1-10000 aqueous solution of mercuric chlorid, using one of the many atomizers, or if the child is sufficiently intelligent have it gargle with the same solution, which will make the throat safe to work with, to be repeated every three or four hours. Then by means of brush or cotton swab, patiently and with care dissolve the exudate, by applying the following:

℞	Papayotin[6] or trypsin	gr. lxx
	Hydrar. chlo. cor.	gr. ¼
	Aqua distil	f.℥ iv
	M.	

Apply every half hour until the membrane is dissolved; and at the same time every half hour alternately, disinfect the throat by using one of our safest antiseptics; the peroxid of hydrogen, though not a germicide[7], accomplishes the same result by interfering with the development of the bacillus. Spray the throat, using from one-half to 15-volume solution, or full strength, which will aid in dissolving the exudate in its formative stage, but fails to do so later, when imbedded in necrotic tissue, for which reasons these applications should be faithfully applied, not even allowing the patient's sleep to interfere; for very frequently the fate of the case depends upon the first twenty-four hours of local treatment, which if persistently and efficiently done, we have reason to believe that the septic influence of the bacteria may be prevented, and instead of a lingering case, we will have a rapid recovery of the patient. We, however, can not afford to confine our remedies to one or two, but suit the remedies to the case; hence, another very valuable and safe disinfectant and good antiseptic successfully used, where the other might be inapplicable, is a 10 grain solution of the nitrate of silver. The solid stick or even a too strong solution, makes it difficult to distinguish the resulting coagulated albumen from the diphtheritic exudate; besides, we have thought that its frequent application tended or predisposed the inflamed mucous membrane to a necrotic condition finally resulting in hemorrhage.

The forcible removal of the exudate and the application by means of cotton wrapped on a pincett, of the following:

℞.	Camphor	20 parts,
	Castor oil	15 parts,
	Alcohol	10 parts,
	Carbolic acid	5 parts,
	Tartaric acid	1 part.
	M.	

is recommended by Grancher,[8] also Dr. Turner of Glasgow, suggests a similar treatment but uses the application of parafin. Being painful the treatment though successfully used in adults, is inappropriate with children, and further the danger of absorption from the wounded surface would be increased. The same objection would apply, it seems to us, to Dr. August Seibert's disc of hypodermic points, through which chlorin water is injected to destroy the bacillus, as it is now known that the bacilli are mostly on the surface of the membrane.

Since the use of corrosive sublimate, first by Billotte in 1876, it seems to be growing in favor. Rennert of Germany, reports repeated successes, by wiping off the exudate with the following:

Hydrarg. chlo. corrosiv.	1 part,
Acid tartaric	5 parts,
Aqua	1000 parts.

The remedy is being largely used in England.

In very young children, the repeated insufflation of washed sulphur, an application which can be thoroughly made where we fail with many other applications, by simply using a glass tube. The good resulting may be attributed to the disinfecting properties of sulphurous acid, set free by the oxidation of the sulphur.

As a topical remedy, we have used the perchlorid of iron in combination with glycerin, equal parts. In hemorrhagic cases it does well. With many it is the principal local treatment.

Carbolic, boracic and salicylic acid, have their appropriate use as antiseptic gargles and sprays, but as every intelligent physician has his own way of using means to ends, these with many others, if time permitted, could be named as suggestive of the fact that it is unwise to restrict our remedies, but treat each individual case, not the disease. Keeping in view and preventing if possible, the tendency of the disease to extend to the larynx as well as to the posterior nares. If to the latter we have,

NASAL DIPHTHERIA.

The nasal passage may be the primary seat of the

[6] The best at our command being papoid.

[7] George M. Sternberg, M.D., on Disinfection, Hare System of Practical Therapeutics.

[8] Le Progress Med., Sept. 27, 1890.

disease; frequently, however, it is the extension of the pharyngeal affection. This complication is recognized by the forced mouth respiration, the nasal passages being closed by the swollen mucous membrane which is covered with a grayish white lining, discharging a thin acrid muco-purulent discharge which later on, becomes greenish yellow tinged with blood.

The glands in the neck soon become involved, with earlier constitutional involvement than in the simple pharyngeal variety. These unpleasant cases are difficult to manage on account of the intricate nasal passage which should be disinfected early by douching and spraying the nasal fossæ.

The former can best be done by means of a perforated flexible rubber catheter, attaching the same to any ordinary syringe, and by bending the patient's head forward, the nasal cavities can be thoroughly and effectually douched preferably with the peroxid of hydrogen, every three or four hours.

The nasal passages may be sprayed with the same remedy, also with a weak solution of carbolic acid, or the corrosive chlorid, but some instructions to the inexperienced attendant will be necessary to the careful introduction of the nozzle of the atomizer, keeping it on a level with the floor of the nasal fossæ and parallel with the septum, so as to prevent wounding and the resulting hemorrhage. The greatest cleanliness should be observed in these cases, using the 1-1000 chlorid wash, and the cremation of all nasal discharges. But as intimated the exudate may extend to the larynx and the result is the most dangerous phase.

LARYNGEAL DIPHTHERIA.

Though the duality of membranous croup and diphtheria is not absolutely settled, yet the fact of their unity, being so regarded by physicians generally, and acted upon approvingly by boards of health is accomplishing good as a check to its spread. The bacillus may primarily attack the windpipe, but like the nasal form it is frequently the extension of the disease into the larynx. Its commencement may be recognized by a hoarse, croupy cough with aphonia and later a gradually increasing dyspnea. These symptoms sometimes subside in a few days under the internal treatment of bichlorid and spray of the same from a steam atomizer, also lime water and 2 per cent. solution of carbolic acid, or, the steam from lime slaking in any ordinary vessel having a perforated lid, to which a tin tube or pipe can be conveyed into a tent constructed over the child—not forgetting proper ventilation—or to the mouth of the patient. We can not expect, however, as much from our spraying and local applications which are so beneficial in the laryngeal and nasal form of the disease. In this connection and in this form of the disease, we wish to call attention to a remedy, the results of which have been recently so satisfactory as to justify further trial, namely, oxygen. It should be given early because of the better oxidation of the blood. The increased tone and strength, both to the nervous and muscular system resulting from the improved condition of the blood, allays nervous irritation and excitability and produces sleep. All of which tends to assist the vital powers of the system to battle with the disease. Three inhalations in succession of about twenty seconds each, allowing the gas to pass through a jar of antiseptic water should be given three or four times daily, or oftener, when there is labored breathing or a cyanotic condition. But should the dyspnea increase, preparation will have to be made to intubate or perform tracheotomy, which leads us into the domain of surgery, upon which it is not our purpose to enter, further than to state that either operation gives the patient about equal chance. Dr. Stern makes the per cent. of recoveries of the former 26 2-5 per cent. and the latter 26 1-2 per cent. The same author recommends intubation under three and a half years of age, and after that time the preference is for tracheotomy, excepting adults. Dr. Montgomery, however, who has had a large experience in intubating writes us that he has had 44 per cent. of recoveries. But in our treatment we should not forget

CONSTITUTIONAL REMEDIES.

Just how soon the poison of diphtheria is taken up by the absorbents, and how much or how little is required to contaminate the system, we have no reliable means of determining. That it is absorbed very rapidly we have only to recall the cases in our experience of heart paralysis after a few days of illness, and the amount to produce septic influence may depend largely upon the susceptibility of the person. But Welch and Flexner have shown that 2 cc. of filtered culture fluid contained toxic properties sufficient to kill a guinea pig. So it is well to begin internal remedies early, and we can make no mistake by giving the chlorid of iron and quinin in large doses suitable to the patient three or more times daily, so as to obtain not only the tonic effect of both, but the antiseptic influence of the iron; or alternate or substitute for the iron the following:

℞. Hydrar. chlo. cor. . . . . gr. jss. (1½)
Syr. aurant rub . . . . .) ā
Aqua āā . . . . . f℥j.
M.

Take from one-half to a teaspoonful every six hours. The object being, as Dr. Jacobi suggests, "to have its specific counteracting effects on the diphtheritic poison in the system."

Chlorate of potash is looked upon with less favor than formerly, because of its unfavorable action upon the kidneys.

The complications or sequelæ of diphtheria in the form of paralysis of the uvula, arms or legs, can best be relieved by general tonics, change of air; we have found a sojourn by the sea of great benefit. Obstinate cases yield to hypodermic injections of strychnia, from 1-20 to 1-60 gr. three times daily. Electricity will also be of service.

Instead of summing up conclusions, allow us to say a word in reference to our future hope—

PROPHYLAXIS.

1. Against personal infection, physicians and attendants should gargle the throat, wash the nasal passages, face and hands before and after visits, in 1–1000 solution of corrosive sublimate, and nothing short of a change of garments is excusable in going from a diphtheritic case to other patients.

2. This paper would be more incomplete than it is, did we not refer to what modern bacteriologists are accomplishing for us, particularly concerning the prevention and cure of the toxic products producing the morbid symptoms which we more or less see in every case of diphtheria.

Dr. E. A. De Schweinitz, Biochemic Laboratory, Washington, D. C., replying to our query, writes:

"Experiments in this country and abroad have demonstrated that a substance (albumose) exists in and can be isolated from the cultures of the diphtheria bacillus which produces, when injected into guinea pigs, immunity in those animals from this disease." Hardly had we begun to ask the question, Why can not this immunity be safely rendered to man? when we learn from Germany that "blood serum" from immunized animals is an anti-toxine which gives immunity to the individual, and that Dr. Aronson of Berlin, claims for his blood serum immunizing strength of 1–10000 for guinea pigs; for children weighing forty-four pounds; 4 ccm. given subcutaneously, which doses afford positive protection if injected before infection; being inefficient in the disease's later stages.

But "later investigations, particularly Behring, have proved that this property of blood serum to counteract the bacterial poison may be progressively intensified, so that by repeated inoculation, a complete immunizing strength can be obtained, potent even against super-virulent bacteria cultures. The injection of blood serum from such animals afforded not only protection against virulent infection, but aborted the already present infection and made it harmless, and therefore proved *a specific cure* for the indicated disease." If these facts can be established in this country and elsewhere, surely the "goal of therapeutic effort" is reached and the glory for the second Jenner is in reserve.

DISCUSSION OF DIPHTHERIA.

Dr. J. A. Larrabee, Louisville, Ky.—It is always well to give the patient the benefit of the doubt and treat the case from the first as though it were a true case of diphtheria until all doubt is removed. I do not agree with one of the speakers that filth plays no important rôle in the production of diphtheria. I think we have some points by which we can diagnose a case rather early in its course. The constitutional disturbances of tonsillitis are sometimes very grave, but they are not followed by the blood changes as in diphtheria. Albuminuria is present in almost all cases of diphtheria in the second stage. Glandular enlargements are present in diphtheria. We can not rely upon the appearance of the pseudo-membrane. I thoroughly agree that many cases have been caused by animal infection. In regard to the preventive treatment I prefer the tincture of the chlorid of iron, and it should be given during the whole course of the disease. It is usually not given in large enough amount. I deem it the best protection against the disease. It increases the number of red blood corpuscles, and thus renders it possible for a larger amount of oxygen to be taken into the body. I am of the opinion that if from ten to twenty drop doses of the tincture of chlorid of iron are frequently given to children the appetite will still remain good. I do not think that we have a better diuretic than the chlorid of iron. In regard to the local treatment, it must precede or at least accompany the constitutional treatment. Corrosive sublimate is, I believe, objectionable. If it is used as a gargle or spray we are very apt to have some cases of death from it. I have used the peroxid of hydrogen, and if carefully used it does very well. Too strong solutions are apt to produce a slough. It is almost impossible to spray or irrigate a child's throat, and for this reason I would recommend the insufflation of boracic acid and papoid; nitrate of silver is also entitled to consideration. One case of diphtheria does not secure immunity for the patient, and hence I think the inoculation method doubtful, although I am very hopeful.

GENERAL DISCUSSION.

Dr. C. S. Greene, Buffalo, N. Y.—I believe in giving the tincture of chlorid of iron in large doses along with quinin and whisky. Of course nourishment should not be overlooked. As a local treatment, the persulphate of iron in a saturated solution can be used. In regard to the prophylaxis, I believe in the use of whisky and chlorid of iron. I also think peroxid of hydrogen a good agent.

Dr. Foster, Chicago, Ill.—I am sorry to see the chlorid of mercury trampled down and the tincture of the chlorid of iron used, both internally and externally. There have been many good results from the use of hyrochloric acid and the chlorat of potassium. I believe much of the good derived from the use of bichlorid of mercury is due to the chlorin present.

Dr. G. A. Lean, Pennsylvania.—I do not believe that the bichlorid of mercury is usually given in the best way, and that it is frequently not given in sufficiently large doses. The chlorid of iron, hydrochloric acid and the chlorat of potassium, which were in vogue so many years ago, are still the principal agents in the treatment of this disease.

Dr. Douglass, Detroit, Mich.—I think we should not be too enthusiastic in the use of iron, unless we are sure there is a sufficient amount of fluid in the stomach to render it sufficiently dilute to prevent its escharotic action, thus preventing vomiting. I think if the tonsils are much inflamed and swollen and encroach upon the air passages, it is well to cut into them. I have never had this operation followed by septic poisoning. I have found some of the tonsils soft and others hard, and in some it was surprising how far the inflammatory action had extended down into the tissues.

Dr. Cook, Chicago, Ill.—I would like to know what per cent. of cases of true diphtheria present albuminuria? I have treated many cases with pyoktannin with good results. It has not been my experience to find albuminuria in all true cases of diphtheria. Does the use of bichlorid of mercury increase the albumen in the urine?

Dr. Ingalls, Chicago, Ill.—I think our present treatment is about the same as our forefathers used. I am of the opinion that the tincture of the chlorid of iron is a very good agent in the treatment of diphtheria. I think it is well to combine it with glycerin and the syrup of tolu. Before giving this combination a draught of water should be taken and the medicine held in the throat some little time before swallowing; in this way we get some local effects from it. If the heart begins to fail, nux vomica is the best agent. If laryngitis presents itself, I think the mild chlorid of mercury should be given until the bowels are moved. Nourishment should never be neglected, milk being the best. A child eight years old should have at least three quarts a day.

Dr. G. B. Dunmire, Philadelphia, Pa.—I am a strong advocate of the use of bichlorid of mercury.

Dr. W. A. Dixon, Ripley, Ohio.—I believe whisky is valuable because it stimulates and carries the patient over the period of depression. Mercury is also valuable. We should use our judgment in the treatment of diphtheria. Do not think we should be tied to any one remedy. The tincture of the chlorid of iron has been very satisfactory to me. So also has whisky and bichlorid of mercury. Give plenty of nourishment.

Dr. F. E. Waxham, Chicago, Ill.—In regard to the use of aseptic instruments, I wish to say, that cases of diphtheria vary greatly in virulency and for that reason along with many others, aseptic instruments should be used.

Blank Applications for membership in the Association, at the Journal office.

RESECTION OF THE RECTUM FOR MALIGNANT DISEASE AND UNION OF THE DIVIDED GUT WITH MURPHY'S BUTTON.

From the Secretary's Report of a Meeting of the Cambridge Society for Medical Improvement.

BY HENRY O. MARCY, M.D.
BOSTON, MASS.

At a recent meeting of the Cambridge Society for Medical Improvement, Dr. Marcy presented the following case:

W. S., aged 46, merchant. During the early part of the summer Mr. S. first noticed slight pain at stool followed by the discharge of a little bloody mucus. First seen late in July. Upon the anterior wall of the rectum fully two inches above the anus, there was situated a well defined growth of an irregular ovate shape, about an inch and a half in its longer diameter. The diagnosis of the disease appeared all too evident, but its location rendered surgical interference seemingly unwarranted. When again seen in September, the growth had completely surrounded the bowel and much suffering was experienced because of partial obstruction. Blood in considerable quantity was daily lost, and colotomy was at once advised. He entered the hospital September 12th, the operation being performed the same day and was discharged the 26th, much improved, free from pain, but still losing daily a considerable quantity of blood. Notwithstanding the various measures that were tried to control the hemorrhage, it gradually increased to such an extent, that danger to life from this cause alone seemed immediate and imminent.

He was re-admitted to hospital on the 17th of October, and assisted by Dr. A. P. Clarke, a modified Kraske operation was performed for the purpose of removing the diseased portion of the rectum. To this end an incision was made posteriorly, about one inch from the anus and was carried upward in the median line upon the sacrum. The coccyx and about two-fifths of the sacrum were removed, which gave room to dissect the rectum from its attachment, dividing the meso-rectum and entering directly into the peritoneal cavity from below. Sufficient length of the bowel was brought down for easy manipulation. The rectum was now divided two inches above the anus, and the constricting diseased portion was split open upon its posterior border, for the double purpose of ascertaining the limitation of the disease, and to aid thereby in the careful separation of the bowel from its anterior attachments, which at the base of the bladder were everywhere closely adherent. The rectum was then divided above the growth, the diseased portion removed, measuring about four inches. Quite a number of vessels were divided in the dissection, but they were easily secured.

During the summer Dr. Marcy had profited by the experiences and instruction of Dr. J. B. Murphy of Chicago, in the use of his anastomosis button, which had been supplemented by experimental studies upon animals. Dr. H. O. Walker of Detroit, only a few days previous to the operation, had suggested to him that this method might be advantageously used in the restoration of the continuity of the rectum, although it had never been applied for this purpose.

The ends of a large sized button were adjusted in the divided extremities of the bowel and compressed. Owing to the thickness of the rectal wall, (the muscular coat of the upper portion being greatly hypertrophied) he reinforced the parts with a continuous suture. He sutured the opening in the pelvic floor in order to prevent the prolapse of the small intestines, which had appeared in the wound, as also to cut off the peritoneal cavity from possible subsequent infection. The posterior wall of the bladder was re-attached to the divided tissues, and a large part of the wound was closed by several lines of buried tendon sutures. An iodoform gauze drain was inserted and dressing applied. Convalescence thus far is rapid and uneventful, the temperature scarcely reaching 100 per cent.

Dr. Marcy also exhibited an interesting specimen of cancer of the uterus removed by vaginal hysterectomy. Mrs. W., age 36, had suffered for years from a badly lacerated cervix, and had been operated on for the removal of a growth which had supervened. Patient is extremely emaciated, and the disease had extended widely upon the vaginal margin. The uterus measures quite four inches in depth and is several times larger than normal. After division of the left broad ligament, the uterus was brought down and with it the right tube which was so distended with a dark colored fluid as to resemble a loop of the small intestine.

Considerable sloughing followed, quite beyond the site of the application of the forceps, and a vesical fistula is the result. This may require subsequent operation, otherwise the convalescence is excellent.

November 10th.—The button was removed the twelfth day, and the patient sent home the twentieth day after the operation. A spring pad has been applied to the colotomy opening, and he has had the liberty of the house. At present there is no evidence of the return of the disease. If he remains well it is proposed to close the opening in the side and restore the continuity of the bowel.

SELECTIONS.

On the Treatment of Malaria and Diphtheria by Methylene Blue.—In thirty cases of malaria with intolerance for quinin, the author has obtained good results by the internal employment of methylene blue. The conditions of the cases are that there were no counter indications against its use, such as nausea, vomiting or polyuria.

It need not be given in very large doses; for example .30 grams two or three times per day. It should be associated with pv. myristica to prevent the appearance of hematuria. The dose of .50 grams per day for adults and .25 to .40 grams for children of four to eight years of age, suffices to obtain an action against the attack of malaria. Methylene blue does not prevent new attacks, but renders them less intense, the same as other anti-malarial remedies.

In fourteen cases of diphtheria, the author has obtained notable amelioration, from painting with methylene blue of 10 per cent. solution in water. This substance, he states, is preferred to chromic acid, carbolic acid water, chlorid of zinc or sublimate, because it is not irritating to healthy tissues.

In saturating the false membranes, it probably prevents the secretion of toxic substances, and opposes itself to the propagation of the bacilli.

Ferreira, in *Bulletin General de Therapeutique*, gives twenty-one observations of infantile malaria treated with methylene blue. He concludes that methylene blue merits large employment in infantile malaria.—A. N. Kazem-Bek in *Revue des Sciences Médicales*.—From *Vratch*.

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All members of the Association should send their Annual Dues to the Treasurer, RICHARD J. DUNGLISON, M.D., Lock Box 1274, Philadelphia, Pa.

SATURDAY, DECEMBER 2, 1893.

THE VIRCHOW JUBILEE.

In our miscellany column of the issue of Nov. 18, we noticed the VIRCHOW Jubilee as a matter of current news, transmitted by cable; by the slower medium of the mail we have the details of that most interesting event.

Our Berlin special is a little late this week, owing to delays in the mails, but none the less interesting is the narrative, told in true German fashion, of the eventful day which celebrated VIRCHOW's entrance as a master in medicine fifty years ago. The venerable KÖLLIKER for once left off looking through his microscope to attend the feast and do honor to his great associate, who has for many years without question, been acknowledged as the most famous medical man of our times. VIRCHOW is known by his writings to the medical men throughout the civilized world, and here in America are many who have been honored by a friendly grasp of his hand and a pleasant salutation, and we but feebly voice the sentiments of our ASSOCIATION, and of all medical men everywhere, when we join our German confrères in saying: Hoch! VIRCHOW! Long life and happiness to the Father of Nineteenth Century Pathology.

MICROBIOLOGIC POISONS.

Microbiologic chemistry is opening to view a series of agents which are capable of influencing the system with greater intensity than any of our mineral or alkaloidal poisons. They are the *toxins* produced by the vital processes of pathogenic bacteria. As alcohol, a product of the growth of the yeast plant, produces when taken into the system a temporary abnormal condition, intoxication, so these agents, products of bacillary growth, exercise on the system temporarily as powerful an impression as disease itself. But as the disease producing effects of the *toxins* can be controlled by regulating the dose, it is not unlikely that among them some may hereafter be found to be of value in antagonizing dangerous poisons or in conferring immunity to certain diseases by exhausting the susceptibility of the individual to the morbific agencies. Indeed, successful experiments in the latter direction have already been recorded.

The tetanus poison is the subject of the latest published investigations in this line. In the fifteenth volume of the *Zeitschrift für Hygiene*, (No. 1) PROFESSOR LUDWIG BRIEGER and DR. GEORGE COHN give an interesting account of their researches. They cultivated the bacillus in veal broth containing one per cent. of peptone and one-half per cent. of sodium chlorid. The cultures were passed through a filter of hard-burned porcelain, and large quantities of this filtrate were used in the research. The tetanus poison was separated by adding an excess of ammonium sulfate to the filtrate. It rose to the surface and was skimmed off with a platinum spatula. By placing it on unglazed porcelain plates the liquid attached to it was absorbed. This crude poison contained some ammonium sulfate, albumen and peptone. After numerous failures the experimenters succeeded in removing the albumen by careful treatment with basic lead acetate and a minute quantity of ammonia. By exposure for from twenty-four to forty-eight hours in a dialyzer, in running water, it was further purified from peptone and salts. Finally, the purified toxin was dried in vacuo at twenty to thirty degrees C. It consisted of transparent, slightly yellowish, inodorous scales, easily soluble in water. It is said to be not a true albumen as it fails to respond to the usual tests for this substance. The purified poison was fatal to a mouse weighing fifteen grams, in a dose of .00000005 gram. In one-fifth of this quantity it caused tetanic symptoms, from which the animal recovered. If equally poisonous to man, the fatal dose for a man weighing seventy kilograms would be 0.23 milligram, or about one two-hundred-and-eightieth grain. The smallest lethal dose of atropin for a grown person is said to be 130 milligrams, and that of strychnin from thirty to one hundred milligrams. The author says: "From this, one can judge what fearful weapons the bacteria possess in their specific poisons." Against chemical and physical agents the dried and purified tetanus poison is not very resistant—even when protected from air, light and moisture it slowly loses its potency. It is soon destroyed by diluted alcohol, but absolute alcohol, chloroform and anhydrous ether do not injure it. In aqueous solution it is destroyed by small quantities of acids or alkalies, and it is even injured by passing carbon dioxid through the solution for three or four hours. On the other hand, oxygen when passed through a solution does not injure its potency, which is destroyed, however, by hydrogen sulfid.

EXACT ELECTRO-THERAPEUTICS A SPECIALTY.

The subdivision of practical medical work in our large cities, and to a certain extent, also, in smaller communities, into departments that engage the special attention of members of the profession is not merely a result of the ever-widening field of medical knowledge, which of itself makes it impossible for any one man to master it fully, but points also to a sadder truth that should not be forgotten, namely, that medical skill in each department is yet so imperfect as to demand the undivided skill of a devotee. This recognition of the advantages of special expertness is but a recent development in modern medicine, though once fully developed in ancient Egypt. Thirty-five years ago there were even no ophthalmologists, the enormous work now performed by these specialists being but imperfectly done by the general surgeons. To-day, the general practitioner or surgeon may at times measure a refraction or determine the presence of a heterophoria, but it is exceedingly seldom that they so far disregard the rights of the patient as to depend on themselves alone in such a matter.

Other specialties are less fully recognized as yet, much dabbling being indulged in otology, laryngology, gynecology and abdominal surgery by good physicians who are not experts in these special lines; but this habit has the excellent excuse in many cases of necessity by reason of the impossibility of obtaining more expert skill on the spot, and the inability of the patient to leave home. It is also warranted by the good results often attending intelligent work of this kind in acute cases. But, aside from abdominal surgery, which has such a host of self-satisfied experts, few amateurs in these several specialties honestly believe that their own efforts cover all possibilities for good to their patients. The need of greater skill in difficult cases is fully admitted by them.

This natural deference to the possibilities attending a special training and daily devotion to a given department of medical effort is, as yet almost entirely wanting in the attitude towards one of the newer specialties, that of electro-therapeutics. No one would for a moment presume to pass judgment against ophthalmology, because his clumsy use of a newly acquired set of instruments failed to enable him to properly extract a cataract, yet this is precisely the attitude of many well-meaning physicians who import from Paris, or elsewhere, a complete set of batteries and electrodes and proceed to attempt some of the most delicate applications of electric energy to internal organs. The object aimed at may be praiseworthy, and even the results may be excellent, as we have often heard attended first attempts in abdominal section, but the method is bad, for it involves the use at once in major work of a powerful instrument of which the user is necessarily ignorant. A peculiarity of this specialty is that, to the qualifications attending expertness in other specialties, such as a particular pathologic, diagnostic and therapeutic knowledge and manual dexterity, there must be added a full acquaintance with the physics of a great natural force, which separates it at once from specialties in which material substances alone are to be handled. A material substance or procedure may achieve results varying with the expertness of the operator, but the possibilities of increasing its value in good hands are necessarily limited and easily defined. In electro-therapy, material results are attained by the application of a force which is capable of almost infinite extension in degree, together with various modifications in quality, resulting in a variability in effect only possible in a force of nature.

These intricacies and latent possibilities of electricity in medicine and surgery are yet by no means a bar to its intelligent use by any broad-minded practitioner who may be determined to afford his patients all that science can offer at his hands. It is, in fact, his duty to test the effect of all well-recommended remedies in cases that prove refractory to tried methods, but unless himself an expert electro-therapeutist, he has no right to assume that electro-therapeutics is a failure in a given class of affections, simply because his own imperfect efforts have not succeeded. His ethical duty to his patient and science should impel him to question his own skill first, and to ascertain if better results could not have been attained had he served the apprenticeship to the art, that is essential to the highest development of skill in any department of human effort.

SALE OF PREPARATIONS CONTAINING POISONS.

A new and unusually interesting question has just been raised in England, of almost as much importance here as there, namely, whether a proprietary medicine containing a poison in very small quantity is a poison within the meaning of a statute which makes it unlawful "for any person to sell or keep open shop for retailing poisons . . . unless such person shall be a pharmaceutical chemist or a chemist and druggist," as there termed. The County Court Judge, who first heard the case, which was an action brought to recover the statutory penalties, gave judgment for the defendant, and the Queen's Bench Court Division of the Supreme Court of Judicature, to which appeal was taken, has decided (under date of Oct. 31, 1893) the same way, dismissing the appeal. In a case decided a little before this one, it was held that a compound containing one or more of the scheduled poisons as one of its ingredients was a poison. In that case, however, there was evidence that there was sufficient morphin in the bot-

tle sold to kill an adult. In this case, a resident of Manchester, not a qualified chemist, who keeps, as the English say, a shop, called a "drug store," sold a bottle of "licoricine," apparently duly labeled, as required by law. The contents of the bottle were analyzed. Morphin was found in it. The actual quantity was not estimated, but the analyst said there was "more than a trace," and there might have been one-fiftieth of a grain per ounce, or three-fiftieths in the bottle. He was not prepared to say whether taking the whole contents of the bottle would do an adult any harm. The analyst was, by the way, purposely left uninstructed about finding out the quantity, in order to raise the question of whether the mere presence of a poison was enough to secure a conviction. The Queen's Counsel maintained that the object of the law was to prevent unqualified persons from dealing with morphin and similar poisons at all. It would be no answer for the seller, who disposed of morphin by itself in very small quantities to say it could not possibly be injurious. It was therefore no answer that it was mixed with other drugs, as here, unless, indeed, it could be said to have changed its character. But the court, as already stated, looked at the matter otherwise, declaring the offense not proved, because there was so little evidence as to quantity, and denying a further appeal, when it was sought to take the case further.

RIGHT OF PHYSICIANS TO AN APPEAL IN MONTANA.

The act of the Montana Legislature of 1889, after providing for the organization of a Board of Medical Examiners, and prescribing its duties in respect to the examination of applicants desiring to practice medicine and surgery in that State, as to their qualifications to be licensed thereunto, and for the issuance of a certificate of license by said board to persons found duly qualified, further provides that "such board may refuse or revoke a certificate for unprofessional, dishonorable or immoral conduct, or refuse a certificate to any one who may publicly profess to cure or treat disease, injury or deformity, in such a manner as to deceive the public. In all cases of refusal or revocation, the applicant, if he or she feel aggrieved, may appeal to the district court of the county where such applicant may have applied for a certificate." This provision for appeal in such cases appears to have been held unconstitutional by one of the district courts, but the Supreme Court of Montana pronounces it constitutional in a decision rendered Oct. 2, 1893, in the case of State v. District Court. The statute, it says, takes no constitutional jurisdiction from any court in the State, but invests the district court with jurisdiction of a class of important cases, to come into it, by way of appeal from the action of the Board of Medical Examiners, just as other statutes on the same footing provide for other important cases to come into the district court by way of appeal from the primary action of other boards or commissioners. Nor does it consider that a physician's right of appeal, with such a hearing as the Legislature contemplates he shall have in the district court, can be denied, because no special rules of practice to be followed therein were prescribed. No doubt the Legislature contemplated that such proceedings should be conducted in such an orderly manner as that no substantial right would be denied. The court being wise in the law and all its analogies, would, it might be confidently expected, adopt such appropriate procedure in the adjudication as would vouchsafe to the accused and to the prosecution a proper hearing; and thereupon such judgment would be pronounced as the law and justice of the case would warrant on the facts shown.

THE APPLICATION BLANK AND ITS USES.

Blank applications for membership in the AMERICAN MEDICAL ASSOCIATION have been sent to many gentlemen who are now members. It was not practicable to expend the time necessary to sort out from State Society lists the names of those who already belonged to the ASSOCIATION, and so the entire list of several States were furnished with application blanks. It was also intended as a pleasant reminder of the best means of increasing the ASSOCIATION membership. That is, for each member receiving the blank to make an attempt to secure an additional member by application. Our already great ASSOCIATION will grow greater, and greater, exactly as fast as our members become enthusiasts in its support. In what noble general movement can our profession hope to succeed, without organization? What expectation is there of forming any other great medical organization to take the place of the old AMERICAN MEDICAL ASSOCIATION?

Use the blanks then, dear readers, in aiding to build what you may, if you choose, make the greatest medical organization in existence, and one with great power for good to all mankind.

ASSOCIATION NEWS.

The American Medical Association Journal.—Let it be remembered by every State Medical Society in America, and by every district or sectional society, that the American Medical Association is the only officially organized body of the profession. With a loyal, energetic effort on the part of the present membership of this society, aided and abetted by the ASSOCIATION JOURNAL, which, under the present management is improving in every issue, there can be no doubt that within a very short time the membership of the ASSOCIATION can be quadrupled, and it will not be long until it surpasses in numbers, strength and influence the British Medical Association.

With such a support, both moral, scientific, and financial, what have we not a right to expect from the JOURNAL? Indeed it will soon be the leading medical journal in the world.—*St. Louis Medical Mirror.*

Change of Date of Meeting—Official Notice.—In order to enable the State Medical Societies to send instructions as to their action in the matter referred to them by the AMERICAN MEDICAL ASSOCIATION at its recent meeting at Milwaukee, and for other reasons, the time of meeting of the ASSOCIATION at San Francisco has been changed from the first Tuesday in May to the first Tuesday in June, 1894.

WILLIAM B. ATKINSON, Permanent Secretary. JAMES F. HIBBERD, President-Elect.

SOCIETY NEWS.

Southern Surgical and Gynecological Association.

Abstract of the Proceedings of the Sixth Annual Meeting, held in New Orleans, Louisiana, Nov. 14, 15 and 16, 1893.

FIRST DAY—MORNING SESSION.

The Association convened in the assembly room of the Medical Department of Tulane University, and was called to order by the President, DR. BEDFORD BROWN of Alexandria, Va., at 10 A.M.

Prayer was offered by the Rev. B. M. Palmer of New Orleans.

An Address of Welcome was delivered by DR. ERNEST S. LEWIS on behalf of the local profession, which was responded to by PRESIDENT BROWN.

DR. A. B. MILES of New Orleans, then reported, as Chairman, on behalf of the Committee of Arrangements.

The reading of papers was then proceeded with, and the first paper read was by DR. HOWARD A. KELLY of Baltimore, entitled

DIAGNOSIS OF PELVIC INFLAMMATORY DISEASES.

He called attention to certain common sources of error in making diagnosis of pelvic inflammation. An erroneous conclusion is often reached in these cases both by general practitioner and specialist by relying for the diagnosis upon such symptoms as dysmenorrhea, more or less persistent pain in the pelvis, attacks of pain confining the patient to bed, diagnosed as peritonitis, difficult locomotion, cachexia (due to morphia habit), tenderness on pressure over the ovarian region, and extreme tenderness at the vault in a vaginal examination. Such a group of symptoms frequently characterizes a false or pseudo pelveo-peritonitis, in which there is actually no demonstrable lesion of any pelvic organ.

In order to make a diagnosis of true pelvic inflammatory disease the inflamed structures must be regarded as of secondary importance in reaching a diagnosis. Even the patient's observation that she has passed a quantity of pus can not be relied upon, unless the pus is seen by the physician, as patients often mistake muco-purulent discharges from the uterus for the emptying of an abscess. Fever, and especially recurrent attacks of fever, are valuable aids in making the diagnosis but fever is generally absent, even in abscesses when the pus is encapsulated. The direct examination, the sole test, is made by the vagina, or by the vagina and lower abdominal wall, and the diagnosis of pelvic inflammatory disease is made when a definite hard resisting mass is felt on one or both sides of the cervix.

Through an empty rectum these masses are still more distinctly outlined. When the disease is not quite so evident, a bimanual examination through the rectum and abdomen should be made, carrying the index finger of the lower hand above the rectal pouch behind the uterus and laterally out on to the broad ligaments. The most minutely accurate examination of the pelvic organs which can possibly be made is called for when ovaries and tubes are enclosed in delicate bands of adhesions which allow considerable mobility to structures not enlarged. This is accomplished by the trimanual method by vagina, rectum and abdomen simultaneously, under anesthesia.

Dr. Kelly exhibited his corrugated tenaculum devised to facilitate this examination. The point of the tenaculum is caught in the anterior lip of the cervix which is drawn down to the hymen, and the tenaculum is held between the third and fourth fingers and the ball of the thumb, while the index finger is introduced into the rectum and, aided by the hand making pressure above giving a plane of resistance, is enabled to examine minutely the posterior surface of the uterus, and all surfaces of the ovaries and the tubes, detecting the slightest adhesions binding these organs down. The examination under anesthesia is a matter of the utmost importance and not sufficiently appreciated. Without anesthesia the most accurate examinations are impossible; it is therefore a sine qua non to the diagnostician.

DR. C. KOLLOCK of Cheraw, S. C., followed with a paper entitled,

THE CONSERVATIVE TREATMENT OF PYOSALPINX.

He said in cases of pyosalpinx, much caution and a very careful and rigid examination are called for to determine the cause of the presence of pus, the length of time it has been there, and the condition of the walls of the tube in which it is found. Attention should also be given to the peritoneum and ovaries, but above all, there should be the strictest inspection of the endometrium, a disordered condition of which contributes much to the production and continuance of pus in the tubes.

Within a year or two, changes have been made in the treatment of pyosalpinx, and conservatism now enters largely into its management. Men of high position in the profession are more decidedly agreed that a moral obligation rests upon us to relieve patients without the sacrifice of any organ, or part of one, when this is compatible with safety. Recently Polk, Pryor, Krug, Boldt and Dudley had reported to the New York Obstetrical Society a number of cases of pyosalpinx treated by the conservative method now in vogue. This treatment, when faithfully carried out by curettement and aseptic divulsion, has not only been successful in saving the tube and ovary on the non-affected side, but in several instances the diseased tube was entirely relieved of the presence of pus. That many cases of pyosalpinx have been accurately diagnosticated and radically cured without the mutilation of any part of the sexual organs, is well authenticated. Dr. Kollock's experience, while limited compared to that of others, has been sufficient to convince him that the conservative system of practice is bringing us to that period when the mutilation of women, once supposed to be necessary, should cease.

Dr. Kollock then reported a few cases of pyosalpinx which had fallen into his hands, the happy termination of which had placed him under obligations to the pioneers in the conservative treatment. All but one of four cases were relieved entirely without resorting to celiotomy.

DR. GEORGE J. ENGELMANN of St. Louis, emphasized the importance of administering an anesthetic in examining patients with pelvic inflammatory disease, before serious operative procedures are entered upon. It was not alone the anesthetic, however, but the practiced touch.

DR. JOSEPH PRICE of Philadelphia, alluded to "dropsical tubes," as being a group of cases that puzzled the practitioner from a diagnostic point of view, and later surgically. Angry pus cases, while acute in their early history, were simply cases to be dealt with surgically. The attacks of pain were numerous, and fixation and tenderness characteristic symptoms. Everything in the pelvis was board-like, and when the surgeon got into the abdomen from above, it was difficult to distinguish the uterus from the appendages and vice versa. These were trying cases to deal with.

DR. JOHN D. S DAVIS of Birmingham, Ala., said he was in favor of evacuating pus wherever it was found in the body. There were, however, some cases in which pus could be removed without sacrificing the ovaries or tubes. As to the use of an anesthetic, he cons ders it absolutely essential in the examination of doubtful cases, but where the diagnosis is plain it is not necessary.

DR. R. B. MAURY of Memphis, said the great difficulty in the class of cases referred to by Dr. Kollock, in which there was pelvic inflammation associated with muco purulent discharges from the uterine cavity, was to decide whether there is pyosalpinx. We have what is denominated endometritis, associated with it normal discharges and exudation in the pelvis, but Dr. Maury says he is at a loss sometimes with the most careful diagnostic measures, whether under ether or without it, to form in his own mind an accurate picture of what the precise state of things is in the pelvis. The rule he has laid down in the treatment of such cases is, if they are acute, non-puerperal or puerperal, that the woman is entitled to a certain period of rest and other measures non-surgical, before deciding upon a radical operation.

Dr. W. E. B. Davis of Birmingham, Ala., believes that, in the examination of patients, it is exceedingly difficult in some cases to make an accurate diagnosis without an anesthetic. However, there were women who could stand the examination well without it.

In regard to endometritis, by judicial and careful curettement, he believes many patients can be saved the necessity of an abdominal section. The trouble is that practitioners often denounce one procedure and uphold another without outlining the indications for a certain position. It is very important to cure the endometritis before it spreads to the tubes, etc.

Dr. R. M. Cunningham of Pratt City, Ala., was inclined to look upon endometritis in the vast majority of cases of disease of the appendages as the *fons et origo* of the whole affair, and he believes that the operation which has been systematized and popularized by Dr. Polk is a safe, conservative and reliable procedure. Furthermore, in the hands of the general practitioner it would relieve many of those cases that go to the laparotomist.

Dr. Bedford Brown of Alexandria, Va., said the mobility of the uterus and its fixations were questions of great importance in diagnosticating pelvic inflammatory disease.

Dr. L. S. McMurtry of Louisville, Ky., delivered a

MEMORIAL ADDRESS ON DR. EPHRAIM M'DOWELL.

He said it would seem almost a work of supererogation to submit an elaborate biographical sketch of McDowell, after the very complete accounts of his life and labors which have been contributed to medical literature by the late Prof. Samuel D. Gross and the late Dr. John D. Jackson; yet, he presumed, that no one would for a moment question the good taste and wisdom of perpetuating in the volumes of Transactions of the Association, the names and deeds of eminent Southern surgeons who had done so much to lay the foundations in America, and the whole world, for the present splendid system of surgery and gynecology. This galaxy of illustrious names would be incomplete without that of McDowell's, the father of ovariotomy and the pioneer of abdominal surgery, which in modern times has grown to such grand proportions.

In the year 1852, twenty-two years after the death of McDowell, Prof. Gross, in his celebrated report on Kentucky surgery to the Kentucky State Medical Society, presented a sketch of the life of this eminent surgeon, with a detailed account of his original surgical work. This sketch was subsequently incorporated in Gross' American Medical Biography, published in 1861.

After giving a sketch of his life, Dr. McMurtry then referred to McDowell's first ovariotomy on Mrs. Crawford, and noted some points with reference to his operative technique. The operation in this case was done without an anesthetic. The incision was made to the left of the median line, about three inches external to the rectus muscle, and was nine inches in length. After opening the peritoneum, he first tied the pedicle with a strong ligature, and then cut open the tumor and removed its contents. He then divided the pedicle, it having been previously tied, and removed the sac. As soon as the incision was made into the abdomen, he states the intestines rushed out upon the table, and were not replaced until the operation was completed, which, he adds, "occupied twenty-five minutes." He then turned the patient upon the left side to allow all fluids to escape. He closed the incision with interrupted sutures and brought out the ligature attached to the pedicle at the lower angle of the wound.

In reporting his cases, he omits mention of the material composing the ligatures, and Dr. McMurtry had been informed by a friend of McDowell, now dead, who was a great deal about McDowell's office in his boyhood, that the ligatures used were made of shoemaker's thread and waxed thoroughly before being used. Adhesive strips and bandages completed the dressing, and in the author's language he prescribed, "a strict observation of the antiphlogistic regimen." The special features of the technique are: 1, the incision was made through the muscular layer of the abdominal wall, three inches external to the rectus muscle; 2, the cyst was not evacuated until after the pedicle was tied; 3, an effort was made to cleanse the peritoneum of fluids; 4, drainage was sought, as well as escape of ligatures, by bringing the ligatures out the lower angle of the incision; 5, the operation occupied only twenty-five minutes, expedition being more the result, doubtless, of the want of an anesthetic than otherwise.

In his report of his second case, he used this language: "I laid her side open." In his third case, however, he adopted the median incision, saying in his report of this case: "I changed my place of opening to the linea alba." In all of his cases, he ligatured the pedicle before separating the adhesions or tapping the tumor. In his third case, he mentions that the ligatures could not be released for five weeks, at the end of which time the cord was taken away.

First Day—Afternoon Session.

Dr. Joseph Price of Philadelphia, read a paper on the subject of

THE INCISION IN ABDOMINAL SECTION—HOW TO CLOSE IT—POST-OPERATIVE COMPLICATIONS ABOUT IT.

He said the question that most vitally concerns surgical and gynecological work was, How can the mortality be reduced? Surgical judgment and surgical fingers repeatedly determine the issue of life or death.

The Incision.—We have nothing from which we can ever approximately determine to what extent the length of the incision influences the mortality. The statistics of comparative results would not prove satisfactory, for the reason of the entry of so many other compromising elements, adhesions, their character, extent and locality. That the incision exercises a greater influence than is generally recognized or admitted, he entertained little doubt. As to length, no rule of mathematical certainty could be laid down. In his own experience, he finds the balance of both convenience and safety to lie with the short incision. The short incision narrows the limits of hemorrhage. It is safe to begin with a small incision, and where the size and character of the tumor or complications present require a larger one, it can easily be made. Very much abdominal work can be done through an opening admitting only two fingers. The reliance of the abdominal surgeon must be largely in educated fingers. In the majority of cases, an operation can be done through a small incision without the operator or spectators seeing viscera. Universally adherent, irreducible or solid tumors require a long incision for delivery and for dealing with complications that can only be dealt with through a long incision, those beneath and on the sides of tumors. In the majority of cases, to so enlarge the opening as to obtain a view of the parts, we augment the risk of ventral hernia and provoke tedious convalescence.

The importance of a perfect closure of the incision has only recently received that attention it deserves. The effort should be to approximate as nearly as possible normal conditions, anticipating and dealing with all existing or possible complications with scrupulous minuteness and care, thus guarding against those accidents which are too frequent. He would not pretend to suggest uniform procedures to be carried out in all cases, as each operator has his own way and does his own work best that way, and it would not be possible for him to apply the methods of others safely and successfully without special training. He is satisfied that the exposure and manipulation of the incision, as well as the peritoneum is harmful. Incisions bathed in pus and filth and freely manipulated often refuse to unite. Suppurating wounds are largely due to careless closure or to tight sutures, including too much tissue. Tight suturing is too common, and has destroyed life in many feeble subjects. Suppuration due to tight suturing and stitch-hole abscesses, in all sections, where they do not result fatally, prolong convalescence. Cases were cited in point.

Through and through suturing, including all structures, more of the central structure than skin or peritoneum, with either silkworm gut or pure silk, give and continue to give the most satisfactory results. Silkworm gut seems to be the favorite material at present, as it possesses all the natural and essential qualities of a suture, is small, strong, and non-irritating—the three cardinal virtues of all good suturing material. Terracing sutures has nothing to recommend it; on the other hand, Dr. Price believes it prolongs an operation. Retraction of skin and peritoneum by the introduction of silkworm sutures gives inclusion to more central structures and the least possible tension on skin and peritoneum. Keith, Tait and Bantock, all use a fine straight needle, and their work has been about perfect. The use of large, curved cutting needles is harmful; their use primarily favors hemorrhage and secondarily stitch-hole abscesses.

Dr. Kelly thinks that long incisions have little or nothing to do with mortality except in an indirect way. Where there are many adhesions a long incision is necessary. Handling of the viscera in pre-antiseptic days increased the chances of suppuration, and consequently of peritonitis and death. The chances of infection, he believes, are greater with a long incision. Hernia comes from improper closure

of the abdominal wall, or the use of, the drainage tube, weakening of the abdominal wall at one of its points.

DR. L. S. MCMURTRY of Louisville, demonstrated his method of suturing on the board. He brings peritoneum to peritoneum, muscular structure to muscular structure, fascia to fascia, skin to skin and says the least quantity of interposing material that we have between the tissues that are to be brought together the better. He disagrees with Dr. Kelly that the drainage tube is the cause of hernia after closing the incision.

DR. R. B. MAURY of Memphis, favored the silkworm gut suture. His experience covers nearly three hundred sections, and he has simply used the through and through suture. He has had almost no abscesses and the fewest possible number of herniæ, which he says can be counted on the fingers of one hand.

DR. T. J. CROFFORD of Memphis, said it was considered that all hernias resulting from abdominal section were due to failure to get union between the opposing layers of transversalis fascia. He uses a long curved needle instead of a straight one. With it he can put in stitches in one-third of the time he can with the ordinary needle. He has used it in upwards of two hundred sections, and has not had a case of hernia to follow one of them. He has also had the fewest number of stitch abscesses.

DR. PRICE in closing, said there was an immense amount of theory about the matter of long and short incisions, and there was a tendency on the part of some to brush aside pre-antiseptic work. Notwithstanding this, however, some of the old back numbers, or hay-seeds, so-called, had as good results in their day as are obtained in some of our hospitals to-day. He urged great caution in the terracing method of suturing.

IS OPERATION DEMANDED IN ALL CASES OF APPENDICITIS? THE BEST TIME TO OPERATE.

This paper was read by DR. A. M. CARTLEDGE of Louisville, Ky. He said that inflammatory conditions of the appendix are essentially intra-peritoneal lesions. Modern surgeons have an abiding faith in the surgical maxim that whenever pus is believed to be present in tissues or organs of the body, it should be removed; hence the new pathology of a very old and frequently fatal malady inspired surgeons to attempt some radical means of relief. Perfection in technique can only come from individual experience and a knowledge of the work of others.

The pathology of a disease is the only true keynote to its rational treatment. Probably the best classification of appendicitis is: catarrhal (simple); ulcerative (from tuberculosis from foreign bodies); perforating (from ulcerative perforation from strangulation, the result of twisting). This classification deals strictly with the changes occurring in the appendix, and should be considered apart from the peritoneal and other conditions which may ensue and cause well-marked variations in the clinical course of the disease. If the walls of the appendix give way in a mass of fibrous adhesions, the result of long-continued irritation, the pus which forms is rather securely encapsulated and may be days, weeks, even years finding an outlet. In fact, as is often the case, if the bacillus coli communis predominates and a few staphylococci are present, it may remain encapsulated unless it receives a new impetus of irritation. Cases were reported, illustrating this point. Cases were also reported, illustrating the part played by injury as an exciting cause in appendicitis, and the belief was expressed that a chronic form of unrecognized appendicitis existed prior to such injury.

We know more about the pathology of ulcerative or suppurative appendicitis than we do of the catarrhal form, because the cases not operated upon which recover are mostly called catarrhal. These are cases which progress with little pain, with very little fever, 101 degrees F., as a maximum, and have a tumor which subsides. These cases are the pride of the poultice and the opium practitioner. Ulcerative appendicitis must be either tuberculous or traumatic, the trauma consisting of foreign bodies and enteroliths, unusually the latter. The tuberculous would only give rise to acute symptoms as the result of cicatrization and stenosis, with distal distension, or secondary inflammation with pus organisms. Either of these results favor perforation. This is essentially the chronic variety, but will eventually lead to perforation, probably in the ways indicated.

When physicians come to view inflammations of the vermiform appendix in their proper light, the author said the prognosis will assume a very different shade. We should consider any appendix once so affected as to deserve the name of appendicitis whether from tubercle or trauma, a lastingly diseased structure, and the fancied cures are quiescent states, the results of very easily recognized conditions. If we could trace our so-called first attack cases of appendicitis through subsequent ones, we would say the progress, not only as to health and comfort but as to life is bad, very bad. A man has the trouble three, four or five times, apparently recovers, all counted as cures probably by different physicians. Finally he dies in an attack; the death is counted but once and sometimes not then; for if, as is often the case, death results from the rupture of an unrecognized appendicial abscess, or from diffuse peritonitis after perforation, the chances are that the cause is never suspected and death is recorded as occurring from peritonitis. Every case of appendicitis, not barred by surgical limitation, should be operated upon. The best time, provided the symptoms are not too urgent, is after the bowels have been thoroughly moved.

DR. JOSEPH PRICE agreed with the author of the paper that there was but one treatment for appendicitis, namely, removal of the appendix. He considers it a murderous disease, to be classed with extra-uterine pregnancy. Both demanded prompt surgical treatment when first discovered. He recommends in acute cases of appendicitis without pus, removal of the appendix and freeing of the inflammatory adhesions.

DR. G. W. LONG of Richmond, opposed operation in every case of appendicitis. Autopsies had shown that one-third of the human race had had at some period of their lives this disease. That being true, and considering the small per cent. of deaths, it naturally follows that appendicitis does not always kill, even if it is not operated on. In the catarrhal form, he thinks there is no reason for operating. In the perforative form we should operate. In the perforative form without adhesions we should also operate as soon as we make a diagnosis.

DR. WILLIAM T. BRIGGS of Nashville, had been operating on every case of appendicitis that came into his hands where the diagnosis was clearly established, and he has had no occasion to regret it. He has operated in cases where there were perforative symptoms, and in others where there were none; in some where there was, and in others where there was not, suppuration, and still others where there was, and where there was not, sloughing.

DR. C. KOLLOCK of Cheraw, S. C., had seen a great many cases of appendicitis. He recommends saline treatment in the first attack, but if there is a recurrence he invariably operates and has never lost a case.

DR. W. E. B. DAVIS of Birmingham, Ala., had never operated on one of these cases without advising a secondary operation for removal of the appendix, telling the patient that the disease would recur. He thought, however, there were many cases that got well without operation, but it was a difficult matter to tell in what cases we should not operate.

DR. HUNTER MCGUIRE of Richmond, said he had many a time operated too late, but never in his life had he operated too soon. If, after free and full purgation with salts, administered by the mouth and rectum, the symptoms are not relieved, he thinks the time for operation has come and does not hesitate to operate. He had never known the mere operation in the hands of skillful surgeons to kill or add to the danger of the patient's life. Appendicitis kills, and it is put down to inflammation of the bowels, peritonitis or something else.

DR. LOUIS MCLANE TIFFANY of Baltimore, said that the cases that require consultation should be divided into those that are going to live without bursting, and those that will rupture inside of three days; and then next to the question of making the diagnosis, was to get the consent of the family physician. The cases that are dangerous die within seventy-two hours, before the family physician is able to make a diagnosis.

DR. WILLIS F. WESTMORELAND of Atlanta, favored early operative interference. He had never been called in sufficiently early by the general practitioner to operate, consequently the patients died promptly. It was necessary to educate the general practitioner to send cases to the surgeon for operation earlier.

DR. W. B. ROGERS of Memphis, had seen cases of catarrhal, ulcerative and gangrenous appendicitis, but had never been able to make a diagnosis till he got inside. The symptoms of the disease were the same as those of peritonitis, localized at the site of the appendix. In the cases he had operated on, he was satisfied that no medicine would have effected a cure.

Dr. Cunningham agreed with Dr. McGuire, that an operation should be done in case medical treatment failed to afford relief.

Dr. Riggs of Birmingham, advocates operation in the recurrent form of the disease during the interval of attacks.

Dr. James A. Goggans of Alexander City, Ala., had operated early on seven cases; all recovered.

SECOND DAY—MORNING SESSION.

Dr. Louis McLane Tiffany of Baltimore, read a paper entitled,

INTRACRANIAL NEURECTOMY, AND REMOVAL OF THE GASSERIAN GANGLION FOR INTRACTABLE NEURALGIA, WITH REPORT OF CASES.

Within the past few years, intracranial excision of portions of the fifth nerve, together with removal more or less complete of the Gasserian ganglion, has been done for the cure of intractable trigeminal neuralgia. The credit of first doing such an operation rests with Rose of London, after whom is to be mentioned Novaro, Horsley, Andrews and others. Dr. Tiffany then gave an account of Hartley's method, which appears in the *Annals of Surgery* for May, 1893.

It has been Dr. Tiffany's fortune to operate four times for excision of intracranial portions of the fifth nerve. In each case the reason for the operation was trigeminal neuralgia, not due to disease of the brain. Hartley's method was followed. All cases recovered from the operation and were relieved of neuralgia, it is to be hoped, permanently.

The operations have been long, but recovery in each instance has been rapid and complete. In all cases the wounds healed at once, except in the fourth case, where the patient scratched the recent wound and infected it.

It is worthy of note, that in the case of the patient upon whom operation was performed fourteen months ago, there is less anesthesia and more perverted sensation than in the other cases. Sensation seems to have returned somewhat, and it is interesting to speculate as to whether sensation will ever completely return, and if so, by what route. Preservation of the sense of taste after division of the second and third divisions is to be noted. That the power to recognize heat and cold exists in a region rendered devoid of ordinary sensation by nerve section, is of much interest, and recalls an observation made some time since, that a conjunctiva insensitive from the local application of cocain still appreciates the difference between heat and cold.

When dividing the third division of the nerve in Case 4, Dr. Tiffany believes that he isolated and recognized the motor branch before dividing it. Not having provided himself with a sufficiently long and fine electrode, he could not prove the accuracy of his opinion by electric stimulation, and therefore divided everything. By leaving intact the motor branch, the patient would not have food collect in the cheek of the paralyzed side, and in future operations an effort should be made towards this end.

THE VAGINAL ROUTE AS COMPARED WITH THE ABDOMINAL, FOR THE REMOVAL OF PELVIC VISCERA

By Dr. George J. Engelmann of St. Louis, Mo. Dr. Engelmann called attention to the advantages offered by the vaginal route for many of the operations, and especially some of the more dangerous now practiced, by means of abdominal section for the removal of the uterus and appendages, and especially in suppurative cases with multiple pus centers. It was vaginal hysterectomy for malignant disease of the uterus which first paved the way to the more extended use of the vaginal route for such operations. He paid a fitting tribute to American surgery when he said that this, like other of the great operations of recent times, emanated from a Southern surgeon. In New Orleans in 1846, Dr. Dubourg fully described this operation, which he had repeatedly practiced with success since 1829, but it was again forgotten until revived within the last decade, and vaginal hysterectomy for malignant disease of the uterus is now everywhere an accepted operation, which is rendered especially safe and rapid by the *forcé* pressure method of Péan; and it was the French surgeon who extended the field to the removal of other contents of the pelvis by the vaginal route, resorting to the piecemeal removal, the *morcellement*, for the extirpation of masses too large to be delivered in their entirety through the vaginal opening. The leaders in this new departure are Péan and Sigond of Paris, Doyen of Reims, and Jacobs of Brussels, and followed for the present by the French school only. In Germany and England these operations are practiced but little if at all, and in this country the vaginal route is limited to the removal of the uterus, vaginal hysterectomy for malignant disease and perhaps for prolapse or inversion. Isolated cases of removal of prolapsed ovaries resting on the vagina, or small and conveniently situated ovarian cysts through the vaginal opening are now and then performed everywhere, but this is a very different matter. The surgeons who are leading in this field vary somewhat in method and in the extent to which they apply it, but the vaginal route now serves them 1, for hysterectomies for the removal of malignantly diseased uteri, and moderately enlarged uteri, for hysterectomy by *morcellement*, for uterine tumors which do not extend above the navel; 2, for the bilateral removal of appendages with diseased uteri; 3, for the treatment of pelvic suppuration of all kinds; 4, Dr. Jacobs even prefers the vaginal method for certain cases in which the appendages of one side only are to be removed. Péan limits hysterectomy by morcellement to benign growths and to all cases of pelvic suppuration treated to-day by laparotomy; whilst Sigond still prefers laparotomy when operation is indicated in unilateral cases, above all in unilateral salpingo-ovaritis when non-suppurative. The indication given by Terrier and indorsed by Jacobs is: 1, the resort to the vaginal route for cases in which suppurative pelvic peritonitis has returned, if laparotomy has already been practiced; 2, suppurative pelvic peritonitis with fixation of the uterus and multiple pus sacs, whilst laparotomy may be resorted to in enuclеable non-suppurative salpingo-ovaritis.

The advantages of the vaginal route are the rarity, if not absence, of shock in cases in which we would have to treat it if the abdominal method were resorted to; rapidity of operation, by reason of the *forcé* pressure method and the total absence of ligature or suture; nearness of the parts to the finger, and in aggravated pus cases guarding of the abdominal cavity from the pelvis proper or the field of operation, by the adhesions and inflammatory products which form a perfect barrier. It seems the natural route for the reaching of parts below the pelvic brim. There is, after operation, perfect drainage established by the forceps and the dressing per vaginam, so that there is no possible stagnation. Recovery appears to be more rapid and more satisfactory than by the abdominal method, the forceps being removed in forty-eight hours, the patient sitting up on the fifth or sixth day, and moving about between the tenth and fourteenth, when cicatrization is completed.

TREPHINING AS A CURE FOR TRAUMATIC EPILEPSY

By Dr. John T. Chapman of Bessemer Ala. He operated on a boy, who, some years previously had received an injury of the head by a blow fracturing the parietals. Three weeks after the injury he began to have epileptic convulsions. At the time Dr. Chapman saw the patient the convulsions had become more frequent, and with greater force. Two buttons of bone were removed at the seat of injury; there was considerable pressure from depressed bone; the membranes were hard and indurated. The indurations were cut out and edges of dura brought together by continuous suture. The wound healed by first intention. For two months after the operation the patient continued to have convulsive seizures, but they gradually grew less until they ceased. The operation was done four and a half years since. The patient is now 18 years old, weighs 170 pounds, and works in a foundry. He believes the doctrine that depressed fractures of the skull without symptoms require no operative interference, is in a measure responsible for many of the unfortunate sequelæ of head injuries.

(To be Continued.)

American Electro-Therapeutic Association.

The Third Annual Meeting Held in Chicago, Sept. 12, 13 and 14, 1893.

Augustin H. Goelet, M.D., President.

(Continued from page 828.)

II.—ACTIVE ELECTRODES.

The best material for the active electrode, when employed at the positive pole, without doubt is platinum. It is everlasting, can be heated red-hot for disinfection, hundreds of times without injury; it can be bent to any desired curve and is not affected in any way by the strongest currents. Its one and only objection is its first cost. Many expedients have been resorted to, to reduce the cost of the electrodes

such as making the electrode of platinum in its lower half and the rest of brass; winding fine platinum wire onto a copper gum elastic or other cheap sound; using carbon aluminum, iron, tin, etc.

Next to platinum comes carbon which is quite equal to platinum in cases in which it is to be applied to the surface of the body or to a large internal mucous membrane, as the interior of the uterus. We would suggest that manufacturers be requested to supply carbon sounds similar to the platinum ones. If that be impracticable, owing to brittleness, to thread carbon beads on a stiff platinum wire so as to give a sound which will be cheap, flexible and capable of disinfection in the spirit lamp and unaffected by its flame. Carbon tips screwed onto an insulated stem are valuable, when they can be made small enough to enter narrow canals like that of the uterus. When the uterine canal is large enough, the carbon electrode is quite equal to platinum in its effects. For intra-uterine galvano-cauterization, zinc has a great advantage of offering an easy means of applying a solution of chlorid of zinc. When the negative pole is attached to the active electrode, gold, silver, copper, iron or steel are admissible. Steel is also useful when employed for negative galvanum punctured in the form of needles. The best way to connect it with the rheophore is by means of a standard binding post and screw, to which the cord of the active pole is attached. For all conducting cords we would recommend the cords used by the Bell Telephone Company, as the standard size and length, as they can be obtained everywhere at very moderate cost. Hard rubber is the best insulating material in general, but in emergencies collodion is very effective, shellac being inferior to either. A good form of insulation is a well disinfected gum catheter. When the active electrode is connected with the positive pole, and when the electrolytic and not the chemic cauterizing effects of the current are desired, both electrodes may be of clay, or carbon covered with clay. The best form of construction where flexibility is required for tortuous canals is a moderately stiff gum bougie, wound for a portion of its length with annealed platinum wire, which can be used on a fresh bougie when one is worn out, but some improvement on this is desirable.

The shapes and sizes for standard electrodes should be as follows: for intra-uterine application the shape should be that of Simpson's sound; the sizes those of the French scale. When carbon or zinc beads or when olivary tips are used, or when the surface is irregular, the best method of estimating the area of surface is by plunging them in water and noting how many centimeters of water they displace. When designated by numerals, as to size and surface, we would recommend that they be stamped when possible by two numbers; the first, representing the size French scale; the second, the area in centimeters of surface. Thus, if one states that he employed an olivary tipped electrode, No. 12-1, it would mean that it would pass through the twelve hole in the French scale and that it would displace 1 centimeter of water. Or, if we said that a uterine sound 17-4, it would mean No 17 in diameter French, and that it had 4 centimeters of surface exposed.

Simplicity of construction and cost of manufacture would be reduced without impairing efficiency, if a standard insulated handle with a uniform thread were adopted throughout the world. Onto this one handle we could screw sets of carbon tips made by a Paris firm, platinum tips made by a Berlin firm, zinc tips made in Chicago, gold tips made in London, flexible tips made in Philadelphia, and so on, the practitioner feeling certain that no matter where he purchases the tips they would fit his insulated handle. As the wear of the screw on the handle would be greater than that of the hole in the tips, the handle screw should be made of steel. The standard thread should be that known to manufacturers as No. 2-40 American gauge. The best means of cleansing is to wash all electrodes in soap and water after using, and to boil them for five minutes before using, in the case of bougies, or by passing them a few times slowly through the flame of a spirit lamp in the case of all metal electrodes.

III.—ACTIVE AND INACTIVE ELECTRODES.

The terms, active and inactive, are the best standard ones we can employ. We have been unable to find any better term to express the fact that we wish to concentrate the effect of the current at one pole and to disperse it at the other. Alternative terms might be concentrated and diffusing electrode, but we prefer active and inactive as more expedient.

We urgently recommend that all connections be made by means of No. 6-32 binding posts, so that the screws of all manufacturers would be interchangeable. Owing to the risk of plug and socket connections becoming loose and dropping out, we recommend that all connections be made by means of standard hole and pressure screws. In case that our suggestion in this respect be adopted by the Association we would recommend that a circular be sent to manufacturers whose address is known, in America and Europe, urging them to adopt this standard screw thread in all connections of instruments made by them.[1]

All of which is respectfully submitted.

A. LAPTHORN SMITH, Chairman.
CHARLES R. DICKSON.

The Committee had its attention drawn to some new electrodes for external use, by Dr. Lucy Hall-Brown. These electrodes were of perforated brass plates of different sizes and shapes, designed to be covered with punk, and with brass springs on back, by means of which connection was made, the springs fitting into split tips on the ends of the conducting cords, which latter also possessed some novel points. Dr. W. J. Morton had also presented a circular, soft rubber cap to cover electrodes and prevent dripping of water, also a sample of "punk" with which he covered his carbon electrodes, a cataphoric electrode with reservoir with a capacity of 1 drachm, also an intra-uterine electrode possessing several advantages.

All of which is respectfully submitted.

DISCUSSION.

DR. MASSEY—remarked that five years ago he devised a spiral platinum electrode, inclosing a second spiral, for use in tortuous canals. It can be rendered aseptic by heating. He did not approve of a soldered connection with the gauze, as it was very apt to break off during the application. No. 20 wire made into a flat coil furnished an excellent groundwork for an electrode. He saw no advantage in having a standard surface for the external electrode, as this did not affect the scientific accuracy of one's work.

DR. MARTIN—said he was the originator of the spiral electrode, and exhibited one before the International Congress in 1887, and published a description of it in the *New York Medical Record*, and other journals.

DR. MASSEY—replied that his allusion was only to a spiral electrode wound about a base which could be readily rendered aseptic. His electrode would be found in practice very different from the one devised by Dr. Martin.

DR. J. B. GREEN, Indiana—said that in 1887, his attention was called to Martin's spiral electrode, and that he then used it in intra-uterine work. As an American and a Yankee, he saw no reason in adopting the French scale. For instance, No. 22 caliber might just as well mean twenty-two one-hundredths of an inch. There was nothing more disgusting to him personally than the saturated clay electrode. The least objectionable is Martin's electrode, although it must be admitted that the animal membrane when moistened soon becomes fetid. For the past two years he had been using an electrode made of saturated wood pulp. It takes up water readily, does not dry easily, and is as cheap as rags, and so can be thrown away when used.

We can not possibly fix upon a standard size for electrodes. If the electrodes are close together, there is marked sensation on the part of the patient—the electric reaction is chemic reaction. We can divide the current over different parts of the body with the same electro-therapeutical effect, and to the great comfort of the patient.

DR. DICKSON—said he had been opposed to the clay pad until the meeting last year, when Dr. Goelet described his modification of the Apostoli pad. This he found very satisfactory.

As an addendum to the report of the Committee, DR. LUCY HALL BROWN read a paper on

ELECTRODES FOR EXTERNAL USE,

in which she recommended a special electrode made of perforated brass plate, with a special device for connecting it with the rheophore.

The sponge electrode to be of any service must be so thoroughly wet that the slightest pressure put upon it will squeeze the water over the patient; and unless a sponge is held by pressure in close contact with the skin it is of little use, for the reason that the current will be so unevenly dis-

[1] We rely upon the assistance of the electrical experts in coming to conclusions of practical value.

tributed from its surface that the using of a high current is out of the question, that is, without causing a severe burning sensation to the patient—a high current may be qualified in this case, at, say, 100 milliampères.

"Felt," although of a close texture, is really a poor absorbent, and can never be made to lie in sufficiently close contact to the skin. It will curl away at every opportunity. The material known as "spongio-pyline," consisting of a mixture of sponge and felt, is practically no better than the felt and for the same reasons.

Absorbent cotton is not sufficiently porous; it packs to such an extent that it gets lumpy, and then becomes an uneven distributor for the current.

Clay, to be serviceable, must be kept well kneaded and when thus applied as a poultice will give good results. It is, from an electrical standpoint, the best by far of all the electrodes thus far mentioned but, on the other hand, it is cold, unclean and troublesome to keep in condition.

Briefly, my electrode consists of a piece of "amadou," or punk, first made moist and laid upon the patient, and on this, but a little smaller than the amadou is laid an annealed piece of perforated brass having suitable device to connect with the battery.

Amadou is a species of fungus—a substance which grows upon old trees in England and on the continent of Europe. It will readily take up more than its weight of water, and in so doing contracts to at least half its former size. When saturated with water it has a fleshy touch, and will readily conform to the irregularities of any body upon which it may be placed. This substance will remain moist for a long time, and a sand bag or other pressure may be put upon it without fear of water running from it over the patient. It is exceedingly porous, and when thoroughly wet forms an excellent conductor. The current is evenly distributed over the whole surface covered by it, and consequently no burning spots are experienced by the patient.

The metal used is a plaque, or flat piece of perforated brass; several of different shapes are herewith submitted. You will notice that they are very smooth on one side, and owing to the punches of the machine in making the perforations slightly rough on the other. The brass, after first being well annealed, can easily be cut with an ordinary pair of scissors to any desired shape, care being taken to follow the perforations in such manner as to leave an unbroken edge all around the plaque.

The flexible conducting cord from the battery is connected to the perforated plaque through the intermediary of a short and well-insulated piece of flexible conducting cord, having at each end a split tip of special design. Two of these short conducting cords are herewith submitted; one complete, the other partly cut away, that you may understand its construction. You will see they are some twenty inches in length and consist of four lengths of the ordinary tinsel conductor twisted together to form one conductor, and pulled through a piece of small rubber tubing which they about fill. A larger size piece of tubing is then drawn over the whole and the tips attached to the ends. This makes a strong, well-insulated and flexible conductor.

These short cords are of value in practice; for instance, it is often found desirable, while having one pole of the battery in continuous connection internally, to have the other pole connected first over the abdomen, then across the back and again over the abdomen, thus changing back and forth several times during the treatment. In practice, therefore, two external electrodes of large surface are used, each having connected to it one of the intermediate cords. One electrode is placed in position under the back and the other across the abdomen. It is then a simple and quick matter to detach the battery cord from one and connect to the other as desired.

To make the connection between the plaque and the short cord, the little brass strip of the plaque is forced into the slit of the tip; thus the corrugations on the former retaining it in place and assuring a perfect connection. The cord from the battery is then connected to the other end of the short cord, by pushing the pointed tip of the former into the longitudinal hole of the latter, the spring sides of the tip, as in the other case, assuring a tight and perfect connection. The whole is simple and easily kept in order, each part being separate and complete in itself. There are no screws to get lost and no chance for sulphites to form between the metal and moist material; the amadou not being attached to the metallic plaque, is easily kept clean and the plaques can be brightened in a moment by rubbing them with a piece of fine emery paper.

(To be continued.)

CORRESPONDENCE.

An Easy Conundrum.—What He Should do with It.

DETROIT, MICH., Nov. 25, 1893.

To the Editor:—In my mail, the other day, I received a blank application for membership. I am already a member and have been for years. What do you expect *me* to do with this blank? Yours truly, J. W. X.

Ans.—Get a new member with it, please.

Pathology of Influenza.

FORT MADISON, IOWA, Nov. 19, 1893.

To the Editor:—In our JOURNAL for Nov. 18, 1893, under caption, "Pathology of Influenza," I find an excerpt from the *St. Petersburger Medicinische Wochenschrift*, in which a painstaking microscopist finds on postmortem, intra-fibrillar hemorrhages invariably unilateral, from which pathologic find he draws the conclusion that the lesions in influenza involve the sympathetic centers. (JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, p. 774, November, 1893). The observation substantiates my anatomico-physiologic deduction as presented in the Iowa State Medical Association in May, 1892. See Transactions of Iowa on page 93. Permit me to inclose reprint and oblige.

Very truly,

W. T. ECKLEY.

Fiftieth Annual of Virchow's Promotion.

FROM OUR SPECIAL CORRESPONDENT.

BERLIN, W., Nov. 6, 1893.

There have been many extraordinary proceedings of medical societies in Berlin in honor of the fiftieth return of the day when Rudolf Virchow took his degree at the hands of the Faculty of Medicine in the Berlin University. We will only take note of the proceedings in the Berlin Medical Society (Medizinische Gesellschaft) as this is the most prominent among the aggregations of this kind in Germany. The meeting took place on the 25th of October in the new-built house of the Society, which as its name implies is devoted to the memory of Prof. Langenbeck. The room was fully decorated with flags, banners and emblems touching the significance of the day. The rooms were so crowded with medical men in holiday attire, that movement of persons was at times very difficult. The meeting was opened by an address of Prof. von Bergmann, who delivered into the hands of the "jubilar" a paper devised by the Society, in which Virchow is made acquainted with his election as Honor-President. In his address, von Bergmann said that the uniting link and the aim of the Medical Society was the promotion of medical science. In his answer, Virchow rejoined that it was right to say that promotion of medical science was the aim of the Society, but not less, advancing of the profession itself. It was true, Government in some directions had well provided for the medical staff, but there remained yet much to be done until the medical order had that position in society which was due to it. As to the motives for this holiday, the fiftieth return of his promotion, some days ago he had been reading his dissertation for the title of M.D. once more. By this he had become conscious how much everybody was influenced in his method of thinking by the opinions of his times. Two pupils of Virchow's, Prof. Rindfleisch (who is now Virchow's successor in the Chair of Pathological Anatomy in Würzburg) and Prof. Ponfick of Breslau, (formerly assistant of Virchow) had come from afar to read papers in honor of the day. Prof. Rindfleisch treated a rare abnormality of the skull which he had seen, producing the speci-

mens. In this paper he recalled Virchow's researches about pathologic alterations of the bones of the skull, especially his fundamental studies on the skulls in cretinism. Having ended his speech he delivered over to Virchow a letter of gratulation of the Medical Faculty of Würzburg, in which was mentioned that, Berlin excepted, Würzburg was the only University at which Virchow had professed his science. Only one of his then mates in the years 1849–1856, Prof. Albert von Köllicker, is a ruddy worker yet; but in Würzburg, the time when Virchow was living there and teaching, was well remembered. In his reply, Virchow especially greeted Köllicker, who then had instructed him well. The last days often had recalled to him his Würzburg years, and he had in mind to give expression to this remembrance by a publication. Prof. Ponfick gave a report on several weighty observations on metastasis of bacteria. By a large line of preparations of bones he showed that bacteria which had made their entrance at any peripheral point of the body remained at last in the bones, and most probably in the lower strata of the periosteum where they under certain circumstances caused pathologic actions whose connection with the first process had not been cleared up till to-day. Ponfick said his investigations were a consequence of the theory of metastasis as founded on Virchow's inquiries. Ponfick ended the speech by delivering the gratulation of the Medical Faculty in Breslau.

Among the many honors presented to Virchow on this occasion, we will yet mention his being nominated Honorary Member of the Physiological Society of Berlin.

THE CHARITÉ HOSTITAL.—In the Royal Charité Hospital in Berlin, one of the largest buildings devoted to curing the sick in Europe, there have of late been opened two new Sections for diseases of the ear, and also for diseases of the throat and nose, under the respective direction of Prof. Frankmann, physician to the German Emperor, and of Prof. B. Frackel. With these two Sections the number of clinical institutions in the Charité Hospital amounts to eighteen. Each part and especially of medicine, has now its separate Section in this Hospital, serving as well for curative purposes as for the instruction of students. Not only in Germany but in Europe this versatility of instruction in one house or, rather collection of buildings, is unequalled. The "Charité" was founded in the year 1727, having then six departments with 200 beds. Together with the progress and specialization of medicine, step by step, the number of buildings serving even more disciples has been augmented. Among others on the grounds of the "Charité" there is the house in which the famous Virchow has his rooms for dissections and microscopic researches, from where his glory and renown has been dispersed throughout the civilized world. Nearly all the Sections of the Hospital are in connection with "clinics." The Hospital has now accommodations for nearly one thousand eight hundred patients. The department for medical instruction has now in contemplation the rebuilding of the oldest parts of the Hospital, adapting them to all newly devised comforts for the sick, with an estimated cost of thirteen millions of marks.

Cerebrin Again.

CHICAGO, Nov. 22, 1893.

To the Editor:—In your issue of August 26, you published a communication of mine on Hammond's cerebrin, in which the presence of nitroglycerin was suspected.

The results of my chemical examination of that article, also of a bottle of Hammond's medullin showed how well founded was that suspicion.

A few weeks later Dr. Hammond made public a reply, the essential part of which is that I could not have analyzed the genuine article, since I failed to find alcohol and boracic acid in it.

Such a way to meet the issue was so weak, under the light of my statement of the true object of my investigation, that I was contented to let the matter rest without any further remarks.

Since then I have seen a circular issued by the Columbia Chemical Co., the manufacturers of Dr. Hammond's animal extracts, which says that I failed to find water, alcohol, boracic acid and animal matter in the samples examined by me.

Therefore, the trade is warned that unscrupulous dealers get empty bottles of Dr. Hammond's products, and fill them with some dangerous imitation, and palm them off as the real article, out of pure deviltry evidently.

Let us bring back the question on its true ground. I never pretended to publish a complete analysis of Dr. Hammond's cerebrin and medullin, because that was unnecessary.

The only question for me to solve was whether the physiologic effects of the two articles are due to some extraneous matter, namely, nitroglycerin, or to some ptomaine.

A priori, there was a faint possibility that a six months, maceration of brain matter might be attended with the production of *neurin*, or neurin and *cholin*, possibly *muscarin* also.

Those three alkaloids have decided and powerful physiologic properties, not entirely unlike those of nitroglycerin. The general tests for alkaloids failed to show their presence.

On the other hand, I obtained decided reaction, characteristic of nitroglycerin, or, I added, some other closely allied substance (some nitrite for instance).

Since the publication of my first note, I examined with exactly the same results, another *unbroken package* of cerebrin.

The original bills seen by me, show that the three samples were sold by the Columbia Chemical Co., (New York) to Messrs. Lehn and Fink (New York) who forwarded it to Messrs. Gale and Blocki (Chicago), from whom I received it unopened. With high regard,

M. DELAFONTAINE.

BOOK NOTICES.

Twenty-Fourth Annual Report of the State Board of Health of Massachusetts. Boston, 1893.

No health reports have ever been issued in America of a higher class than those of Massachusetts, whether we regard the matter from the standpoint of practical utility, or that of pure science. The fortunate possessor of a set of these reports from the beginning has an excellent library on practical hygiene.

This report is in nowise inferior to its predecessors. It contains 1, the general report containing a summary account of the doings of the Board during the year; 2, a series of special reports on water supply and sewerage; 3, report on artificial ice; 4, report on food and drug inspection; 5, weekly mortality report of cities and towns; 6, reports (5) upon epidemics of typhoid fever in Massachusetts in 1892; 7, health of towns.

The foregoing enumerations of the headings of the table of contents, by no means give more than a suggestion of the valuable reports contained in the volume; they must be seen and read to be appreciated.

We suggest to our brethren in those States where there is yet no Board of Health, that the proper distribution of this report to influential members of their Legislature, would be the most effective object lesson they could use.

The Diseases of Childhood (Medical). By H. Bryan Donkin, M.A., M.D., Oxon., F.R.C.P., East London Hospital for Children, at Shadwell; Physician and Joint Lecturer on Medicine and Clinical Medicine, Westminster Hospital. Octavo, 440 pages. Muslin, price $4.00. New York: Wm. Wood & Co. 1893.

"This book," says the author in his preface, "is based to a great extent on the records and recollections of nearly twenty years' experience at the East London Hospital for Children, and includes the substance of some lectures given at Westminster Hospital, and of a few contributions to the Westminster Hospital Reports."

The work is divided into six sections, of which Section I, containing fourteen chapters, is devoted to "Disorders of the Alimentary Tract and of the Abdomen;" Section II, containing five chapters, to "General Diseases;" Section III, "Acute Febrile Diseases," contains nine chapters and an appendix, the latter being an abstract of the conclusions given in the report of a committee appointed by the Clinical Society of London, to investigate the periods of incubation, and contagiousness of certain infectious diseases. Section IV contains nine chapters on "Disorders of the Nervous System;" Section V has eight chapters on "Diseases of the Respiratory System," and the concluding Section, VI, is given to the consideration in four chapters of "Disorders of the Heart and Circulation." The appendix to Section III will be of especial interest to health officers, as there is given, for smallpox, chickenpox, measles, rubeola (Rotheln), scarlet fever, influenza, diphtheria, enteric fever and mumps, the incubation period, the infectious period, and the time of quarantine for each. The book is well printed on high class paper, but contains no illustrations. It is well worthy a place in the library.

Surgery; A Practical Treatise with Special Reference to Treatment. By C. W. Mansell Moullin, M.A., M.D., Oxon. F.R.C.S., Surgeon and Lecturer on Physiology to the London Hospital, etc. Assisted by various writers on special subjects, with 600 illustrations, many of which are printed in colors, about two hundred having been made from special drawings. Second American Edition, Revised and Edited by John B. Hamilton, M.D., LL.D., Professor of the Principles of Surgery and Clinical Surgery, Rush Medical College, Chicago; Professor of Surgery, Chicago Policlinic; Surgeon Formerly Supervising Surgeon General U. S. Marine Hospital Service; Surgeon to Presbyterian Hospital; Consulting Surgeon to St. Joseph's Hospital and Central Free Dispensary, Chicago; Secretary General of the Ninth International Medical Congress, etc., etc. 8vo, cl., pp. 1,238. Philadelphia: P. Blakiston, Son & Co. Chicago: The W. T. Keener Co. 1893.

From the editor's preface we extract the following:

"Its wide scope, its clear expression, and its excellent illustrations made it (the first edition) a favorite; and these characteristics have been preserved in the American edition now offered. The work has undergone thorough revision wherever necessary, and many new illustrations from the most recent foreign and domestic monographs have been added, and such changes in the text have been made as recent changes in theory and practice required. Some rearrangement has been made of the text, and a brief chapter on the outlines of military surgery has been added. To make room for the new matter and new illustrations, without materially increasing the bulk of the book, certain portions of the former chapters on diseases of the skin, diseases of the eye, diseases of the ear and larynx as were not strictly surgical, have been omitted. Among other additions, the chapter on amputations has been enlarged by the addition of a number of new illustrations, and surgical bacteriology has been newly illustrated by colored engravings from recent monographs."

This edition, we notice, retains the same frontispiece as the former one, except that Prof. Senn's face has been substituted for the somewhat insipid-looking face of the original. The other parts of the picture, which by the way do not represent the operation, might as well have been omitted. The other illustrations introduced for the first time are mainly from the recent "Traité de Chirurgie" by Duplay and Rectus, the most exhaustive encyclopedia of surgery yet published, and the beautiful illustrations from Esmarch's "Chirurgische Technik," and many colored illustrations from Woodhead, and in military surgery from the official manuals and instructions.

A comparison with other works on surgery for the year will show that the book has been brought fully down to date; as examples we may mention a reference to Senn's bone "thimble" or "ring" for gunshot fracture, p. 1212, and the same author's new hip-joint amputation, p. 1195; Watson's prostatic cannula, p. 1080.

NECROLOGY.

Dr. William Winchester of Elgin, Ill., November 20.

Dr. James Campbell of Detroit, Mich., November 19.

Dr. Alfred North of Waterbury, Conn., November 18.

Dr. E. Lane Schofield of Chambersburgh, Pa., November 19.

Dr. A. J. Hiserote, one of the pioneers of Hardin County, Iowa, died November 1.

MISCELLANY.

Doctor's Drummers Must Wear Tags.—We learn from the *Hot Springs Medical Journal* that the City Council of that enterprising resort has enacted that hereafter the drummers who solicit patronage for the local physicians must be duly labeled according to law, and wear a numbered tag.

Office Thief Caught.—Dr. J. W. Middleton of Steelton, Pa., had his office robbed, and valuable surgical instruments stolen November 13. The thief was caught next day at Middleton, Pa., having attempted to sell the instruments to some of the physicians of that place. The first to whom the instruments were offered, suspected that they were stolen and the telephone did the rest.

New Hospitals.—The Catholics have leased a building at Des Moines, Iowa, for the purpose of establishing a Mercy Hospital. The institution will be in charge of the Sisters of Mercy.

A new hospital at Clifton, Staten Island, is projected by certain society people of that place. The use of a building at Belair Road and Tompkins Avenue has been donated by Mrs. Nathaniel Marsh for two years. The new hospital will be open to receive patients December 18.

Locked in Jail by Mistake.—A physician of Cassopolis, Mich., was called to attend a sick prisoner in a jail. The turnkey who let the Doctor in, is a little absent-minded, and he forgot all about the circumstance. The Doctor whose feelings may be easily imagined, was locked up with his sick prisoner for several hours before the turnkey happened to think about him.

Alumni will Smoke Four Times a Year.—The Alumni Association of the Medical Department of the University of Pennsylvania, held the first of a series of unique entertainments called a "Musical Smoke" November 18, at the Colonnade Hotel, Philadelphia. The University Glee and Banjo Club furnished the music. There were about two hundred and fifty members present.

Smallpox.—The number of cases of smallpox in the country at the present time is considerable. No less than six States have reported cases lately. We recently published the action of the State Board of Health of Pennsylvania in relation to Reading, and the disease is manifestly increasing in Chicago, where the Health Officer announced that there were twenty-one cases in the smallpox hospital on November 23.

Quarantine Raised.—Dr. Brunner, the Health Officer of Savannah, raised the quarantine against Southern points, except Brunswick and Jesup, November 16. A slight frost occurred in Savannah on that date, and also at Brunswick, where the advent of the cold wave was hailed with great rejoicing. November 19, upon notification from Surgeon H. R. Carter of the Marine Hospital Service, that danger had passed, Dr. Brunner raised the quarantine against Jesup.

List of Foreign Countries and Places in which cholera has been officially reported since June 1, 1893. From Abstract of Sanitary Reports. Those in italics have been reported during the week ended Nov. 9, 1893:

AFRICA.—Alexandria, at lazaretto; Mogador, quarantine station; Saint Louis, Richard Tull, Dagana, N'Daen, Dalmath, Podor, Malam, and Goree-Dakar, Senegal.

ARABIA.—Djeddah, Mecca, Medina, Mina; also along the Hejaz.

AUSTRIA AND AUSTRIA-HUNGARY.—Beregh, Bohorodezany, Bralia (Roumania), Dees, Doboka, Hattyen-Kerec, Kolomea, Nadworna, Sanok, Stanislaw, Szaholes, Szatmar, Tisza, Vienna; also in *Galicia* and Bukowina, Buda-Pesth, Kis-Varda, Doreebad, Szaboles (county of), Marmoros (county), Jasz-Nagy-Kun Szolnok.

BELGIUM.—*Antwerp, city and province*, Brussels.

BRAZIL.—Rio de Janeiro,[1] San Paulo.

FRANCE.—Alais, Aubenas, Avignon, Bordeau, *Brest*, Cadiz, Camaret, Cette, Chautenay les Nantes, Cuers, Hyères, Larcat, La Seyne, La Vallette, Lambezellac, Limoges, Lorient district, Lyons, Marseilles, Mines, Mirepoix, Montpellier, Nantes, Pamiers, Pierre Benité, Privas, Salon, Sorgues, Toulon, Toulouse, Vannes district, Department of Basses Alpes.

GERMANY.—Barmen, Berlin, Cologne, *Danzig*. Donaueschingen, Duisburg, Geestemünde, Hamburg, Homberg, (district of Moers), *Magdeburg*, Neuss, Neuwied, *Neustadt*, Papiermühle, Solingen, *Stettin*, St. Goars, St. Goarshausen.

GREAT BRITAIN.—*Hull*, Grimsby, Liverpool, London, Newcastle, Rotherham.

INDIA.—*Calcutta*.

ITALY.—Aquila (province of), Anna Capri, Alessandria (province of), Barra, Bubbio, Caivano, Campalasso, Capri (island of), Castellamare, Canerta, Cueno (province of), Feddio, Fresonaro, Furori Grotta, Gragnano, Gaeta, Genoa, *Leghorn*, Maddaloni, Montegioco, Naples,[2] Origlio, Pisa, *Palermo*, Pavia, Piedmont, Roccanerano, Rome, Rouniglano, Rouaverano, San Guliano Vecchio, San Salvatore, Sorrento, Sulmona, Torre Garfali, Torre Annunziata, Trapani.

JAPAN.—Hiogo, Osaka.

NETHERLANDS.—Ameide, *Amsterdam*, Avereest, Delft, Deventer, Dubbledam, Durgerdam, Elden, Giesendam, Hansweert, Kralingen, Koog a. d. Zaan, Leerdam, Molenaarsgraaf, Nieuwe-Wetering, Oudshoorn a. d. Rhijn, Ouwerschie, Puttershock, Renkum, *Rotterdam*, Rumpt, Rozendaal, Streefkerk, Ter Neusen, The Hague, Utrecht, Wonbrugge, Werkendam, Ysselmonde, Zuilichem, Zwijndregt, Zaandam.

RUSSIA.—Governments of Astrakhan, Baku, Bessarabia, *Charchoff*, *Cherson district*, *Don district*, Elissavetpol, Ekaterinoslav, Erivan, Grodno, Kalish, Kaluga, *Kazan*, Kharkoff, Kieff, *Koutais*, *Kostroma*, *Kovno*, *Kuban*, *Kursk*, Kutaisk, *Livonia*, *Lublinsk*, Lomza, *Minsk*, *Moscow*, Movieff, Nicolaieff, *Nijni-Novgorod*, Novocherkask, Orel, *Olonetz*, Orenberg, *Orloff*, Perm, *Penza*, *Petersburg*, Plozk, Podolia, Podolsk, *Plotavà*, Radom, Redout-Kale, Riazan, Saratoff, Samara, *Sedletz*, Sebastopol, *Simbirsk*, *Smolensk*, *Stavropol*, *Tamboff*, Taurida, Tersk, Tchernigoff, Terscheu district, Tiflis, Tobolsk, Tomsk, *Tula*, *Tver*, Ufa, Vilna, Viatka, Vladimer, Volinsk, Volhymnia, Voronesh, Warsaw, *Yaroslaff*; cities of Baku, Batoum, *Cronstadt*, Ekaterinoslav, Helsingfors, Kertch Kieff, *Moscow*, Nijni-Novgorod, Poti, Rostoff, Riga, *St. Petersburg*, Sebastopol, Tiflis, *Warsaw*.

SERVIA.—Belgrada.

SPAIN.—Abando, Algorta, Amorevieta, *Arboleda*, *Arrigarriaga*, *Baracaldo*, Basauri, *Begoña*, *Berango*, *Bilbao*, Catalonia, *Campillo*, *Deusto*, Echavarria, *Erandio*, *Gallarta*, Galdames, *Guenes*, *Labarge*, *La Concha*, *La Franco Belga*, Las Arenas, Les Carreras, Lejona, *Matamoras*, Musques, Leguieitio, *Orconera*, *Ortuella*, Parcocha, *Portugalete*, *Pucheta*, San Salvador del Valle, Santurce, *Sestao*, Turre, Urioste, Ursueli, Vedia, Zalle.

SWEDEN.—Umea.

TURKEY.—Aboulhassib, Abovdjeruil, Abrufassié, Avassum, *Bagdad*, Bassorah, Constantinople, Chatra Amara, Djilila, Guermah, Hai, Hassan-Hayoun, Hit, Aamissieh, Kut, Menasin, Mohammerah, Mountefik, Nazrieh, Samara, Shouk-el-Sheouk, Smyrna, Tau, Zolen, Zubeir.

[1] Officially denied.

[2] In the province of Naples the following towns are reported: Cassino, Chinetela, Gragnano, Nocera, Pagana, Scafati.

New Subscribers.—Like other medical journals, the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION is in the field for new subscribers. It is by no means intended that the needs of non-members shall go unrecognized by the JOURNAL, and by the spreading before the JOURNAL'S readers of the weekly budget of information from all quarters, the JOURNAL has become truly a medical newspaper, in which every item of professional interest worthy of record is noted while still fresh; and in this respect the JOURNAL, while managed primarily for the benefit and pleasure of its owners the AMERICAN MEDICAL ASSOCIATION; the ASSOCIATION in founding the JOURNAL, intended it for the instruction and pleasure of medical men everywhere, whether affiliated or not. In this way the JOURNAL has, and needs subscribers, and in their interest it only asks that a fair comparison be made with other weekly medical journals, and it is sure that such comparison can only result favorably for the JOURNAL OF THE ASSOCIATION.

New subscribers sending in their subscriptions now, will have the remaining numbers for 1893 sent free.

THE PUBLIC SERVICES.

Army Changes. Official list of changes in the stations and duties of officers serving in the Medical Department, U. S. Army, from November 18, 1893, to November 24, 1893.

First Lieut. MADISON M. BREWER, Asst. Surgeon U. S. A., is granted leave of absence for one month, on surgeon's certificate of disability, with permission to go beyond the limits of the Department.

Major CURTIS E. MUNN, Surgeon, U. S. A., leave of absence granted is extended two months.

Marine Hospital Changes. Official list of changes of stations and duties of medical officers of the U. S. Marine Hospital Service, for the four weeks ended November 18, 1893.

Surgeon GEORGE PURVIANCE, to report at Bureau for temporary duty, Nov. 7, 1893. To inspect Reedy Island Quarantine, Nov. 14, 1893.

Surgeon H. R. CARTER, to proceed to Jessup, Ga., for temporary duty, Nov. 10, 1893.

P. A. Surgeon C. E. BANKS, to rejoin station, Portland, Me., Nov. 3, 1893.

P. A. Surgeon S. D. BROOKS, to inspect service at Ashtabula, Ohio, and then to rejoin station, Cleveland, Ohio, Nov. 13, 1893.

P. A. Surgeon W. P. MCINTOSH, granted leave of absence for twenty-three days, Nov. 17, 1893.

P. A. Surgeon G. M. MAGRUDER, granted leave of absence for thirty days, Nov. 1, 1893. To proceed to New Orleans for duty, Nov. 15, 1893.

P. A. Surgeon H. T. GOODWIN, leave of absence extended thirty days, Oct. 24, 1893.

P. A. Surgeon J. O. COBB, leave of absence extended twenty days, Nov. 14, 1893.

P. A. Surgeon G. M. GUITERAS, granted leave of absence for thirty days, Nov. 14, 1893.

P. A. Surgeon J. C. PERRY, to rejoin station, Vineyard Haven, Mass., Nov. 3, 1893.

Asst. Surgeon W. J. S. STEWART, to proceed to Reedy Island and Delaware Breakwater Quarantine Stations, for temporary duty.

Asst. Surgeon EDGAR STRAYER, to rejoin station, Boston, Mass., Nov. 3, 1893.

LETTERS RECEIVED.

(A) Atkinson, Wm. B., Philadelphia; Aschman, G. A., Wheeling, W. Va.; Antikamnia Co., St. Louis, Mo.; (B) Brick, P. L.; Le Mars, Iowa; Bates & Morse, New York City; Baldwin, J. F., Columbus, Ohio; (C) Cleaves, M. A., New York; (D) Davis, W. B., St. Joseph, Mo.; (E) Eagleston, J. B., Seattle, Wash.; (F) Frambes, L. S., Philadelphia, Pa.; (G) Galvano-Faradic Battery Co., New York, N. Y.; Griffith, W. H., New York, N. Y.; (H) Hayes, L. H., Union Springs, Ala.; Holmes, Oliver Wendell, Boston, Mass.; (J) Jorden, H. C., Lincoln, Neb.; (K) Kutnewsky, J. K., Redfield, S. Dak.; Kern, W. B., Hastings, Neb.; (L) Lentz, Charles & Son, Philadelphia, Pa.; Lasher, G. W., Los Angeles, Cal.; (M) Maltine Mfg. Co., New York, N.Y.; McGahan, C. F., Aiken, S. C.; Murrell, T. E., St. Louis, Mo.; McArthur Hypophosphite Co., Ansonia, Conn.; (P) Porter, P. B., New York City; (R) Rosenberger, John L., Chicago; Rogers, S. F., Troy, N. Y.; Robinson, Fred Byron, Chicago; (S) Lee, E. J., New York, N. Y.; Smith, F. T., Chattanooga, Tenn.; Solis-Cohen, S., Philadelphia, Pa; Souchon, Edmond, New Orleans; Starr, F. W. G., Toronto, Canada; (T) Tilton, H. R., Ft. Omaha, Neb.; Travis, E. M., Eagle Grove, Iowa; The Sanitarium, Battle Creek, Mich.; (W) Waxham, Frank E., Denver, Col.; (V) Valentine, Mary F., Philadelphia, Pa.